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LAMPIRAN – LAMPIRAN

LAMPIRAN 1

Lampiran 1.

Main parameters of ship-bulb combinations of data collected with $C_b = 0,7$

Table 2 Main parameters of ship-bulb combinations of the data collected with $C_b = 0.7$ (see Fig. 14)

Model	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
without bulb	C_B	0.6846	0.689	0.6891	0.6918	0.6924	0.6963	0.6967	0.6967	0.6970	0.7004	0.7033	0.7145	0.7227	0.7266
	C_{WL}	0.8173	0.8389		0.7931	0.7762				0.8058			0.8449	0.7994	
	C_M	0.9829	0.9868	0.8785	0.9938	0.9845	0.9916	0.9733	0.9733	0.9868	0.9920	0.9829	0.9949	0.9845	0.9816
	C_{PE}	0.6865		0.7211	0.6919	0.6994	0.7148	0.7234	0.7234	0.6703	0.6452	0.6662	0.6985	0.6994	0.6945
	L_{WL}/B	7.5489	6.088	5.293	6.4997	6.0061	5.702	6.094	6.094	7.2094	7.315	8.171	6.7414	6.7170	6.517
	B/T	2.1539	3.006	3.153	2.8285	3.0402	2.972	3.114	3.114	2.2575	2.491	2.168	2.3259	3.0402	2.724
	L_F/B	3.774	3.044	2.0472	2.880	2.4561	2.855	2.978	2.978	3.1634	2.907	3.501	2.9250	2.4561	2.514
	C_B	0.6846		0.6935	0.6977	0.7069	0.7026	0.7055	0.7028	0.7062	0.7047	0.7070	0.7194	0.7373	0.7317
L_F/B	3.774		2.244	3.4639	2.6587	3.063	3.240	3.197	3.4162	3.1100	3.673	3.4639	2.6587	2.722	
C_{LPR}	0.0370	0.0299	0.0433	0.0329	0.0330	0.0363	0.0440	0.0368	0.0381	0.0251	0.0258	0.0329	0.0296	0.0330	
C_{BB}	0.1554	0.0840	0.1762	0.1821	0.1798	0.1717	0.2091	0.1746	0.1538	0.1463	0.1351	0.1821	0.1798	0.1734	
C_{ZB}	0.6377	0.6580	0.5612	0.6730	0.9333	0.5938	0.5587	0.5852	0.5810	0.6309	0.4267	0.5530	0.9333	0.5652	
C_{ABT}	0.1008	0.0465	0.1103	0.1056	0.1090	0.1035	0.1367	0.1061	0.1032	0.0956	0.0802	0.0879	0.1090	0.1008	
C_{ABL}	0.1829	0.1258	0.1286	0.1498	0.1516	0.1237	0.1696	0.1284	0.1832	0.1096	0.1268	0.1230	0.1516	0.1157	
$\%C_{YPR}$	0.3356	0.1350	0.4015	0.3929	0.3606	0.2871	0.5878	0.3618	0.3120	0.2246	0.1819	0.3118	0.3096	0.2875	
$\%C_{Ytot}$	1.2026	0.3782	0.6466	0.8712	0.3713	0.9071	1.2547	0.8462	1.3183	0.6207	0.5177	0.6936	2.0363	0.6957	
$\%C_S tot$	3.0572	1.4159	2.1905	3.0228	2.8112	3.0283	3.0692	2.4268	2.5054	2.3123	1.8757	2.6458	2.4545	2.3753	

Design of Bulbous Bows

LAMPIRAN 2

Lampiran 2.

Penentuan nilai kecepatan model kapal

Berdasarkan persamaan (2.21) dimana $\frac{V_m}{\sqrt{g \cdot L_m}} = \frac{V_s}{\sqrt{g \cdot L_s}}$ maka dalam menentukan kecepatan model sebagai berikut.

- Kecepatan 5 knot

$$\begin{aligned} Fns &= \frac{V_s}{\sqrt{g \cdot L_s}} \\ &= \frac{V_m}{\sqrt{9,81 \times 1,8}} \\ &= 0,097 \end{aligned}$$

$$Fns = Fnm = 0,097$$

$$Fnm = \frac{V_m}{\sqrt{g \cdot L_m}}$$

$$0,097 = \frac{V_m}{\sqrt{9,81 \times 1,8}}$$

$$V_m = 0,406 \text{ m/s}$$

- Kecepatan 6 knot

$$\begin{aligned} Fns &= \frac{V_s}{\sqrt{g \cdot L_s}} \\ &= \frac{3,086}{\sqrt{9,81 \times 72,1}} \\ &= 0,116 \end{aligned}$$

$$Fns = Fnm = 0,116$$

$$Fnm = \frac{V_m}{\sqrt{g \cdot L_m}}$$

$$0,116 = \frac{V_m}{\sqrt{9,81 \times 1,8}}$$

$$V_m = 0,488 \text{ m/s}$$

- Kecepatan 7 knot

$$\begin{aligned} Fns &= \frac{V_s}{\sqrt{g \cdot L_s}} \\ &= \frac{3,601}{\sqrt{9,81 \times 72,1}} \\ &= 0,135 \end{aligned}$$

$$Fns = Fnm = 0,135$$

$$Fnm = \frac{V_m}{\sqrt{g \cdot L_m}}$$

$$0,135 = \frac{V_m}{\sqrt{9,81 \times 1,8}}$$

$$V_m = 0,569 \text{ m/s}$$

- Kecepatan 8 knot

$$\begin{aligned} Fns &= \frac{V_s}{\sqrt{g \cdot L_s}} \\ &= \frac{4,115}{\sqrt{9,81 \times 72,1}} \\ &= 0,155 \end{aligned}$$

$$Fns = Fnm = 0,155$$

$$\begin{aligned} F_{nm} &= \frac{V_m}{\sqrt{g \cdot L_m}} \\ 0,155 &= \frac{V_m}{\sqrt{9,81 \times 1,8}} \\ V_m &= 0,650 \text{ m/s} \end{aligned}$$

- Kecepatan 9 knot

$$\begin{aligned} F_{ns} &= \frac{V_s}{\sqrt{g \cdot L_s}} \\ &= \frac{4,630}{\sqrt{9,81 \times 72,1}} \\ &= 0,174 \\ F_{ns} &= F_{nm} = 0,174 \\ F_{nm} &= \frac{V_m}{\sqrt{g \cdot L_m}} \\ 0,174 &= \frac{V_m}{\sqrt{9,81 \times 1,8}} \\ V_m &= 0,732 \text{ m/s} \end{aligned}$$

- Kecepatan 10 knot

$$\begin{aligned} F_{ns} &= \frac{V_s}{\sqrt{g \cdot L_s}} \\ &= \frac{5,144}{\sqrt{9,81 \times 72,1}} \\ &= 0,193 \\ F_{ns} &= F_{nm} = 0,193 \\ F_{nm} &= \frac{V_m}{\sqrt{g \cdot L_m}} \\ 0,193 &= \frac{V_m}{\sqrt{9,81 \times 1,8}} \\ V_m &= 0,813 \text{ m/s} \end{aligned}$$

- Kecepatan 11 knot

$$\begin{aligned} F_{ns} &= \frac{V_s}{\sqrt{g \cdot L_s}} \\ &= \frac{5,658}{\sqrt{9,81 \times 72,1}} \\ &= 0,213 \\ F_{ns} &= F_{nm} = 0,213 \\ F_{nm} &= \frac{V_m}{\sqrt{g \cdot L_m}} \\ 0,213 &= \frac{V_m}{\sqrt{9,81 \times 1,8}} \\ V_m &= 0,894 \text{ m/s} \end{aligned}$$

LAMPIRAN 3

Lampiran 3.

Perhitungan nilai tahanan pada Fn 0,213.

- dp 0,008

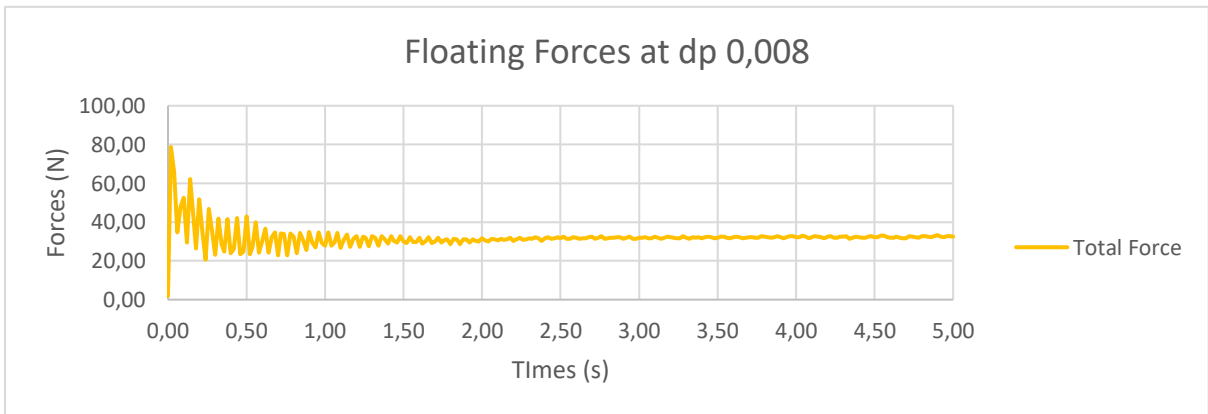
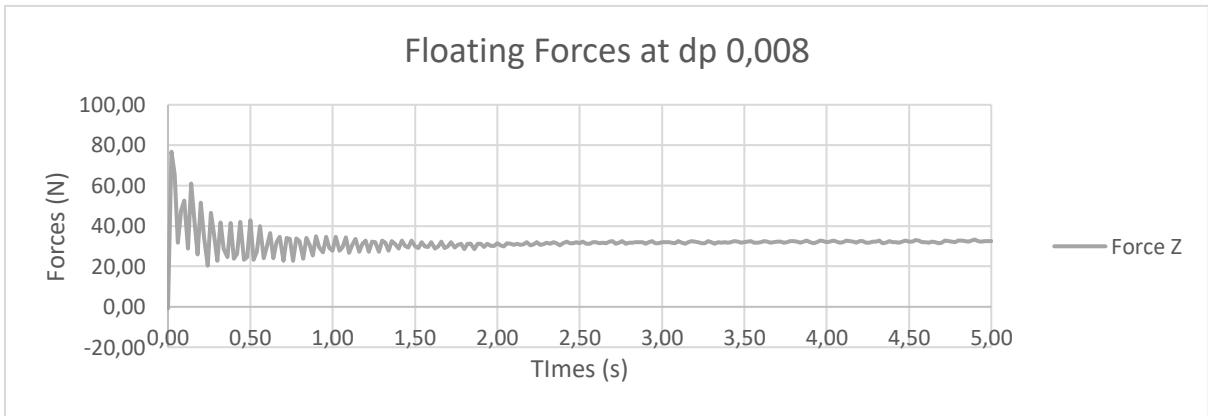
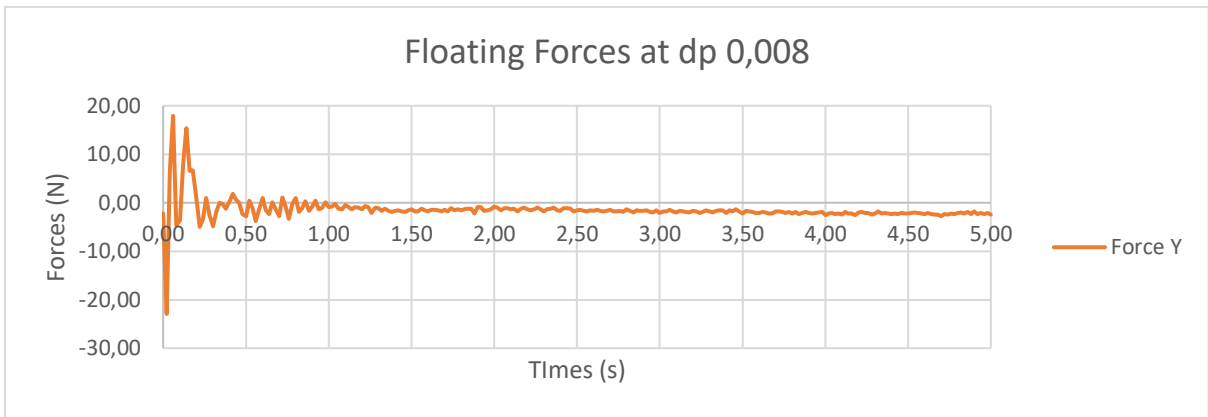
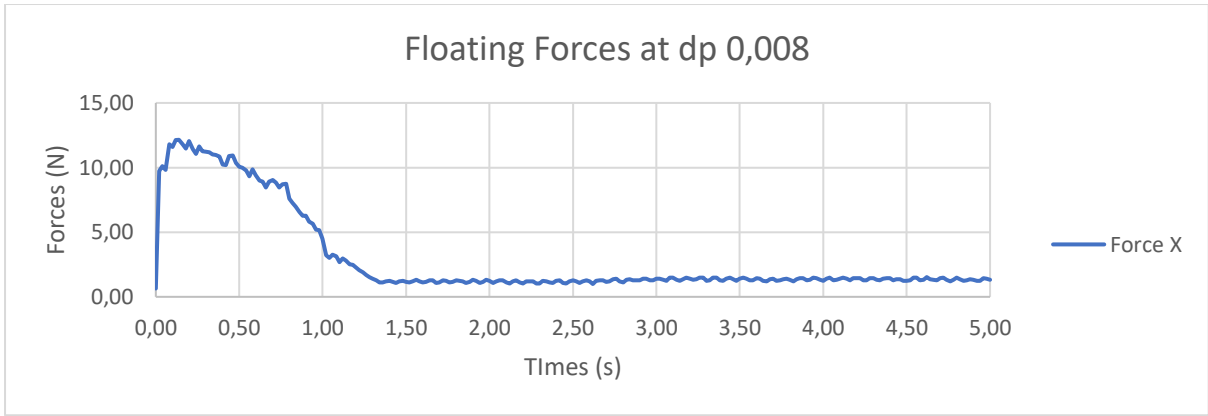
Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	0,645	-2,241	-0,791	1,873
1	0,02	9,733	-22,928	76,797	78,730
2	0,04	10,099	6,720	65,573	65,836
3	0,06	9,809	17,912	31,755	34,551
4	0,08	11,784	-4,666	47,679	47,823
5	0,10	11,607	-3,681	52,503	52,602
6	0,12	12,132	8,109	28,780	29,494
7	0,14	12,147	15,327	61,014	62,111
8	0,16	11,799	6,577	42,929	43,262
9	0,18	11,456	6,712	25,949	26,497
10	0,20	12,037	0,578	51,591	51,637
11	0,22	11,445	-5,003	34,619	34,871
12	0,24	11,046	-3,397	20,398	20,627
13	0,26	11,624	0,968	46,634	46,686
14	0,28	11,252	-2,497	35,357	35,465
15	0,30	11,236	-4,851	22,718	23,088
16	0,32	11,200	-1,897	41,852	41,941
17	0,34	11,028	0,026	28,465	28,529
18	0,36	10,990	-0,208	24,679	24,742
19	0,38	10,847	-1,233	41,517	41,591
20	0,40	10,249	0,334	23,934	23,997
21	0,42	10,205	1,811	26,126	26,205
22	0,44	10,896	0,687	42,055	42,106
23	0,46	10,948	-0,042	23,250	23,305
24	0,48	10,369	-2,387	24,700	24,804
25	0,50	10,049	-2,744	42,927	43,005
26	0,52	9,974	0,404	23,340	23,387
27	0,54	9,760	-1,130	27,134	27,200
28	0,56	9,329	-3,785	39,821	39,949
29	0,58	9,862	-1,450	24,097	24,152
30	0,60	9,388	0,966	29,885	29,940
31	0,62	8,983	-1,587	36,527	36,577
32	0,64	8,910	-2,298	24,179	24,265
33	0,66	8,470	0,137	32,067	32,099
34	0,68	8,919	-1,256	34,531	34,583
35	0,70	9,039	-2,771	22,825	22,960
36	0,72	8,817	1,126	34,007	34,043
37	0,74	8,460	-0,751	33,692	33,721
38	0,76	8,719	-3,347	22,650	22,839
39	0,78	8,741	-0,147	33,967	33,997
40	0,80	7,591	0,964	32,570	32,602
41	0,82	7,253	-1,900	23,801	23,882
42	0,84	6,984	-1,078	34,230	34,268
43	0,86	6,574	0,270	30,615	30,640
44	0,88	6,275	-1,633	25,425	25,489
45	0,90	6,252	-0,786	34,867	34,897
46	0,92	5,832	0,432	29,390	29,418
47	0,94	5,666	-1,367	26,928	26,974
48	0,96	5,202	-1,120	34,704	34,739
49	0,98	5,159	0,082	29,108	29,137
50	1,00	4,491	-0,947	27,794	27,826

51	1,02	3,218	-0,746	34,607	34,633
52	1,04	3,025	-0,235	27,765	27,789
53	1,06	3,272	-1,271	29,613	29,654
54	1,08	3,146	-1,294	34,407	34,441
55	1,10	2,700	-0,479	26,769	26,791
56	1,12	2,965	-0,939	30,780	30,811
57	1,14	2,822	-1,327	33,649	33,687
58	1,16	2,532	-0,916	27,199	27,230
59	1,18	2,488	-1,070	31,247	31,276
60	1,20	2,260	-1,347	32,758	32,793
61	1,22	2,071	-0,652	27,319	27,348
62	1,24	1,905	-0,933	32,308	32,336
63	1,26	1,704	-2,087	31,991	32,046
64	1,28	1,540	-0,998	27,371	27,402
65	1,30	1,412	-1,181	32,724	32,758
66	1,32	1,290	-1,641	31,862	31,905
67	1,34	1,129	-1,286	27,826	27,863
68	1,36	1,113	-1,731	32,585	32,627
69	1,38	1,215	-1,849	31,110	31,162
70	1,40	1,256	-1,623	28,863	28,913
71	1,42	1,152	-1,518	32,788	32,825
72	1,44	1,070	-1,803	30,119	30,166
73	1,46	1,207	-1,942	29,326	29,384
74	1,48	1,218	-1,606	32,822	32,864
75	1,50	1,145	-1,296	29,947	29,982
76	1,52	1,111	-1,780	29,056	29,106
77	1,54	1,194	-1,822	32,104	32,153
78	1,56	1,310	-1,225	29,758	29,798
79	1,58	1,193	-1,616	29,564	29,610
80	1,60	1,107	-1,751	31,926	31,970
81	1,62	1,138	-1,487	28,916	28,957
82	1,64	1,282	-1,418	29,925	29,968
83	1,66	1,261	-1,533	32,234	32,276
84	1,68	1,089	-1,807	29,025	29,074
85	1,70	1,116	-1,476	29,856	29,894
86	1,72	1,275	-1,748	31,928	31,978
87	1,74	1,240	-1,181	29,330	29,366
88	1,76	1,098	-1,547	30,736	30,775
89	1,78	1,135	-1,398	31,089	31,125
90	1,80	1,268	-1,524	28,623	28,671
91	1,82	1,247	-1,381	31,292	31,331
92	1,84	1,185	-1,186	31,198	31,230
93	1,86	1,063	-1,274	28,636	28,669
94	1,88	1,153	-2,281	31,111	31,177
95	1,90	1,316	-0,913	31,144	31,176
96	1,92	1,222	-0,926	29,537	29,568
97	1,94	1,084	-1,650	31,146	31,187
98	1,96	1,148	-1,585	30,254	30,297
99	1,98	1,313	-1,337	30,049	30,091
100	2,00	1,220	-0,748	31,594	31,619

101	2,02	1,074	-1,061	30,427	30,454
102	2,04	1,175	-1,543	29,869	29,912
103	2,06	1,270	-1,090	31,415	31,448
104	2,08	1,294	-1,149	31,141	31,176
105	2,10	1,119	-1,318	30,588	30,621
106	2,12	1,013	-1,246	31,340	31,368
107	2,14	1,189	-1,784	30,740	30,789
108	2,16	1,283	-1,255	31,053	31,090
109	2,18	1,116	-0,985	31,946	31,971
110	2,20	1,030	-1,394	30,322	30,355
111	2,22	1,191	-1,615	30,996	31,040
112	2,24	1,196	-1,356	31,945	31,981
113	2,26	1,183	-0,974	30,694	30,723
114	2,28	1,024	-1,351	31,050	31,081
115	2,30	1,042	-1,816	31,629	31,673
116	2,32	1,238	-1,367	31,217	31,255
117	2,34	1,210	-1,202	32,097	32,129
118	2,36	1,114	-1,041	31,507	31,534
119	2,38	1,060	-1,514	30,349	30,386
120	2,40	1,219	-1,648	31,473	31,518
121	2,42	1,277	-1,177	32,227	32,261
122	2,44	1,086	-1,162	31,470	31,499
123	2,46	1,024	-1,284	31,578	31,607
124	2,48	1,178	-1,771	32,127	32,173
125	2,50	1,268	-1,615	31,581	31,627
126	2,52	1,193	-1,506	32,296	32,335
127	2,54	1,070	-1,718	31,240	31,282
128	2,56	1,195	-1,824	31,332	31,381
129	2,58	1,284	-1,585	32,127	32,172
130	2,60	1,209	-1,674	31,992	32,037
131	2,62	0,992	-1,408	31,418	31,449
132	2,64	1,217	-1,700	31,609	31,655
133	2,66	1,295	-1,748	31,472	31,523
134	2,68	1,286	-1,731	32,194	32,242
135	2,70	1,137	-1,465	32,480	32,516
136	2,72	1,178	-1,817	31,276	31,325
137	2,74	1,369	-1,828	31,792	31,847
138	2,76	1,396	-1,645	32,570	32,620
139	2,78	1,179	-1,843	31,214	31,264
140	2,80	1,112	-1,370	31,703	31,737
141	2,82	1,315	-1,674	31,868	31,917
142	2,84	1,359	-1,956	31,883	31,942
143	2,86	1,292	-1,524	32,054	32,097
144	2,88	1,262	-1,704	32,105	32,152
145	2,90	1,269	-1,637	31,220	31,267
146	2,92	1,416	-1,573	31,926	31,975
147	2,94	1,385	-1,939	32,444	32,503
148	2,96	1,297	-1,969	31,372	31,430
149	2,98	1,276	-1,563	31,451	31,496
150	3,00	1,419	-2,091	31,895	31,961

151	3,02	1,398	-1,837	31,989	32,046
152	3,04	1,325	-1,839	32,058	32,111
153	3,06	1,237	-1,409	31,667	31,705
154	3,08	1,466	-1,769	31,482	31,540
155	3,10	1,467	-1,961	32,453	32,515
156	3,12	1,335	-1,713	31,762	31,813
157	3,14	1,242	-1,834	31,242	31,294
158	3,16	1,363	-1,922	31,881	31,939
159	3,18	1,480	-2,061	32,424	32,490
160	3,20	1,385	-1,691	32,226	32,277
161	3,22	1,310	-1,805	31,973	32,025
162	3,24	1,349	-2,109	31,475	31,540
163	3,26	1,500	-1,950	31,573	31,638
164	3,28	1,471	-1,601	32,593	32,644
165	3,30	1,257	-1,750	31,959	32,008
166	3,32	1,278	-1,965	31,198	31,256
167	3,34	1,496	-1,707	32,076	32,132
168	3,36	1,474	-1,601	31,826	31,878
169	3,38	1,283	-1,550	32,063	32,107
170	3,40	1,217	-2,074	31,629	31,687
171	3,42	1,406	-1,595	32,023	32,073
172	3,44	1,499	-1,773	32,434	32,491
173	3,46	1,354	-1,375	32,183	32,225
174	3,48	1,250	-1,829	31,702	31,754
175	3,50	1,402	-2,263	31,962	32,034
176	3,52	1,503	-1,692	32,363	32,419
177	3,54	1,422	-1,796	32,507	32,562
178	3,56	1,292	-1,937	31,813	31,869
179	3,58	1,278	-2,159	31,695	31,759
180	3,60	1,440	-2,096	32,116	32,183
181	3,62	1,382	-1,886	32,528	32,584
182	3,64	1,248	-2,018	32,181	32,238
183	3,66	1,178	-2,277	31,610	31,676
184	3,68	1,355	-2,276	31,937	32,008
185	3,70	1,387	-1,770	32,244	32,297
186	3,72	1,223	-1,772	32,173	32,221
187	3,74	1,269	-1,948	31,748	31,803
188	3,76	1,377	-2,094	31,885	31,950
189	3,78	1,419	-1,879	32,582	32,639
190	3,80	1,336	-2,264	32,505	32,574
191	3,82	1,204	-1,929	32,239	32,292
192	3,84	1,347	-2,298	31,842	31,914
193	3,86	1,455	-2,169	32,261	32,331
194	3,88	1,432	-1,894	32,818	32,876
195	3,90	1,271	-2,071	32,087	32,147
196	3,92	1,308	-2,280	31,487	31,558
197	3,94	1,486	-2,120	32,070	32,140
198	3,96	1,451	-1,959	32,754	32,815
199	3,98	1,314	-1,907	32,557	32,611
200	4,00	1,253	-2,578	31,995	32,075

201	4,02	1,401	-2,181	32,195	32,263
202	4,04	1,466	-2,062	32,829	32,894
203	4,06	1,292	-2,338	32,324	32,394
204	4,08	1,326	-2,234	31,687	31,756
205	4,10	1,393	-2,455	32,128	32,208
206	4,12	1,485	-1,942	32,759	32,821
207	4,14	1,419	-2,196	32,414	32,483
208	4,16	1,263	-2,186	32,217	32,280
209	4,18	1,436	-2,513	31,649	31,734
210	4,20	1,452	-2,021	32,407	32,471
211	4,22	1,458	-1,935	32,657	32,718
212	4,24	1,285	-2,169	31,819	31,883
213	4,26	1,284	-2,127	31,836	31,899
214	4,28	1,463	-2,493	32,343	32,426
215	4,30	1,450	-2,241	32,271	32,343
216	4,32	1,318	-1,759	32,686	32,736
217	4,34	1,292	-2,203	31,394	31,461
218	4,36	1,405	-2,154	31,851	31,919
219	4,38	1,448	-2,191	32,523	32,593
220	4,40	1,456	-2,328	32,099	32,176
221	4,42	1,269	-2,174	31,903	31,966
222	4,44	1,374	-2,283	31,753	31,825
223	4,46	1,380	-2,077	32,336	32,400
224	4,48	1,237	-2,196	32,714	32,776
225	4,50	1,241	-2,260	32,226	32,292
226	4,52	1,262	-2,073	32,216	32,276
227	4,54	1,501	-1,998	32,949	33,013
228	4,56	1,473	-2,113	32,895	32,962
229	4,58	1,291	-2,187	32,045	32,110
230	4,60	1,335	-2,325	31,979	32,051
231	4,62	1,513	-2,098	31,754	31,825
232	4,64	1,377	-2,353	32,271	32,345
233	4,66	1,327	-2,414	31,936	32,011
234	4,68	1,286	-2,495	31,506	31,585
235	4,70	1,435	-2,757	31,619	31,715
236	4,72	1,480	-2,356	32,726	32,803
237	4,74	1,331	-2,468	32,429	32,505
238	4,76	1,213	-2,214	32,264	32,327
239	4,78	1,336	-2,342	31,897	31,970
240	4,80	1,466	-2,093	32,670	32,736
241	4,82	1,374	-2,030	32,820	32,880
242	4,84	1,241	-2,181	32,477	32,539
243	4,86	1,268	-1,846	32,219	32,271
244	4,88	1,367	-2,318	32,768	32,839
245	4,90	1,311	-1,743	33,299	33,348
246	4,92	1,221	-2,317	32,406	32,473
247	4,94	1,250	-2,118	32,176	32,237
248	4,96	1,432	-2,315	32,649	32,723
249	4,98	1,395	-2,086	32,640	32,703
250	5,00	1,340	-2,423	32,410	32,485



Berdasarkan grafik diatas, nilai tahanan model kapal untuk $F_n 0,213$ terjadi pada waktu 4,0 – 4,5 s. Sehingga apabila dirata – ratakan nilai tahanan model kapal 2,743 N.

- dp 0,006

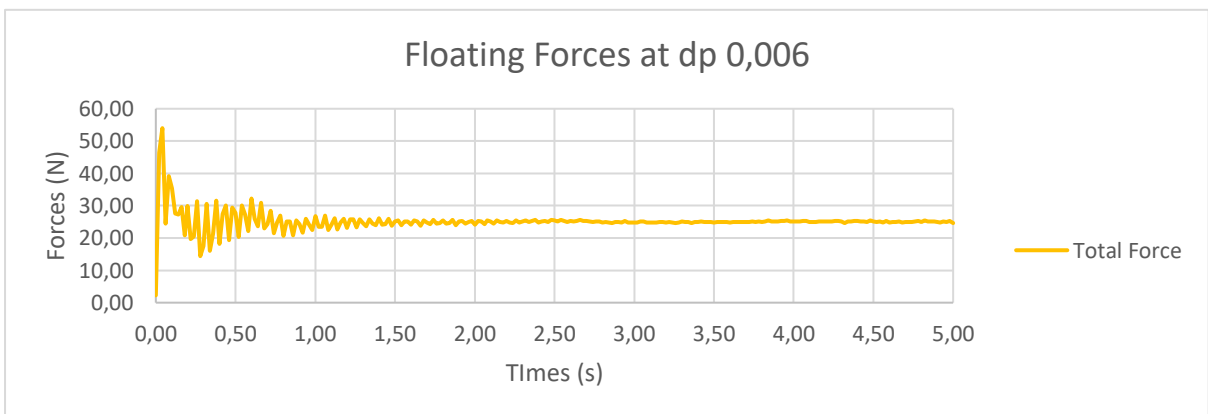
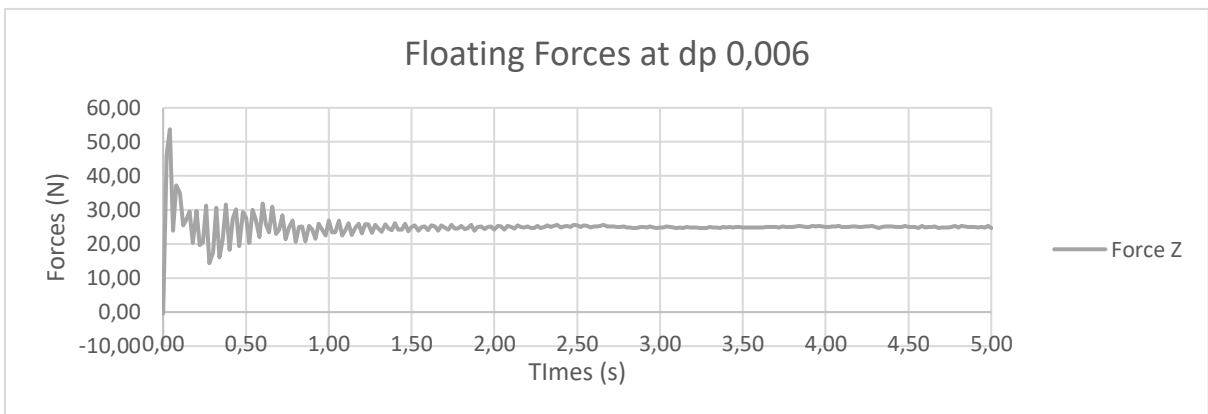
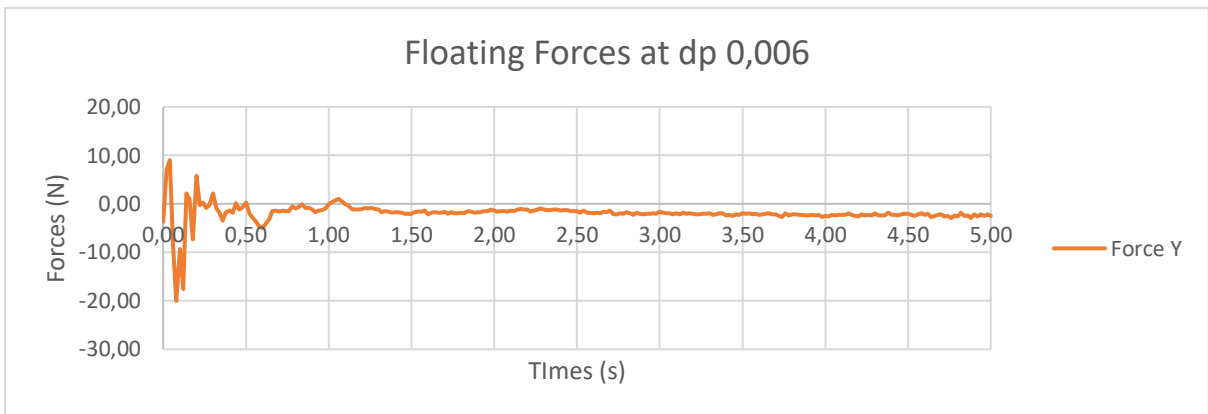
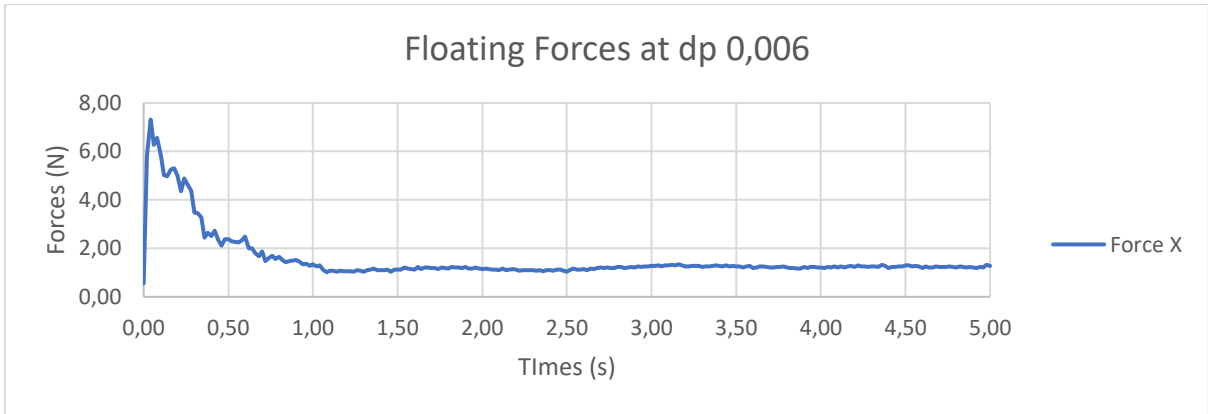
Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	0,551	-3,693	-0,431	2,264
1	0,02	5,802	7,047	46,131	46,357
2	0,04	7,314	9,013	53,678	53,994
3	0,06	6,267	-8,496	23,869	24,480
4	0,08	6,551	-20,016	37,268	39,182
5	0,10	5,852	-9,276	34,839	35,301
6	0,12	5,012	-17,517	25,464	27,576
7	0,14	4,967	2,088	27,135	27,192
8	0,16	5,260	0,870	29,464	29,498
9	0,18	5,304	-7,353	20,339	20,854
10	0,20	5,020	5,810	29,646	29,877
11	0,22	4,360	-0,262	19,648	19,692
12	0,24	4,895	0,310	20,390	20,444
13	0,26	4,649	-0,882	31,316	31,351
14	0,28	4,369	-0,343	14,321	14,382
15	0,30	3,467	2,165	17,510	17,589
16	0,32	3,465	-0,830	30,623	30,645
17	0,34	3,273	-1,845	16,040	16,108
18	0,36	2,438	-3,504	21,161	21,278
19	0,38	2,645	-1,716	31,578	31,613
20	0,40	2,508	-1,398	18,187	18,227
21	0,42	2,726	-1,886	27,448	27,483
22	0,44	2,335	0,143	30,108	30,123
23	0,46	2,101	-1,196	19,361	19,393
24	0,48	2,376	-0,739	29,435	29,453
25	0,50	2,372	0,266	27,701	27,718
26	0,52	2,292	-1,983	20,263	20,319
27	0,54	2,264	-2,799	30,062	30,126
28	0,56	2,245	-3,614	27,153	27,258
29	0,58	2,333	-4,573	22,004	22,199
30	0,60	2,481	-5,079	31,969	32,134
31	0,62	1,993	-4,086	25,825	25,956
32	0,64	1,999	-3,258	23,505	23,605
33	0,66	1,813	-1,542	30,881	30,907
34	0,68	1,661	-1,346	22,896	22,924
35	0,70	1,868	-1,637	24,185	24,221
36	0,72	1,465	-1,384	28,381	28,402
37	0,74	1,608	-1,490	21,469	21,503
38	0,76	1,684	-1,492	24,715	24,745
39	0,78	1,553	-0,528	26,840	26,853
40	0,80	1,641	-0,911	20,633	20,657
41	0,82	1,521	-0,596	25,031	25,048
42	0,84	1,431	-0,097	25,092	25,105
43	0,86	1,473	-0,882	20,725	20,747
44	0,88	1,498	-0,849	25,361	25,380
45	0,90	1,513	-1,120	24,191	24,214
46	0,92	1,461	-1,710	21,549	21,589
47	0,94	1,337	-1,376	25,937	25,962
48	0,96	1,371	-1,300	24,095	24,120
49	0,98	1,270	-0,993	22,418	22,438
50	1,00	1,335	-0,068	26,825	26,836

51	1,02	1,247	0,345	23,424	23,436
52	1,04	1,308	0,712	23,377	23,393
53	1,06	1,118	1,012	26,835	26,853
54	1,08	1,006	0,455	22,453	22,465
55	1,10	1,072	-0,035	24,134	24,145
56	1,12	1,078	-0,366	26,086	26,098
57	1,14	1,042	-1,090	22,656	22,677
58	1,16	1,073	-1,174	24,818	24,839
59	1,18	1,060	-1,181	25,973	25,993
60	1,20	1,053	-1,082	23,121	23,141
61	1,22	1,063	-0,814	25,715	25,730
62	1,24	1,027	-0,960	25,799	25,815
63	1,26	1,090	-0,878	23,275	23,293
64	1,28	1,069	-1,067	25,688	25,707
65	1,30	1,044	-1,184	24,558	24,579
66	1,32	1,099	-1,754	23,547	23,583
67	1,34	1,119	-1,457	25,783	25,810
68	1,36	1,163	-1,644	24,491	24,524
69	1,38	1,106	-1,807	23,984	24,021
70	1,40	1,092	-1,680	26,019	26,050
71	1,42	1,093	-1,754	24,147	24,182
72	1,44	1,126	-1,874	24,248	24,286
73	1,46	1,042	-2,062	25,897	25,937
74	1,48	1,114	-2,063	23,729	23,773
75	1,50	1,131	-2,048	25,020	25,062
76	1,52	1,128	-1,670	25,412	25,444
77	1,54	1,204	-1,605	23,893	23,926
78	1,56	1,158	-1,564	25,046	25,076
79	1,58	1,138	-1,448	25,156	25,184
80	1,60	1,116	-2,176	24,101	24,149
81	1,62	1,226	-1,830	25,473	25,511
82	1,64	1,140	-1,702	25,108	25,141
83	1,66	1,200	-1,845	23,840	23,880
84	1,68	1,208	-1,848	25,423	25,461
85	1,70	1,196	-1,664	24,824	24,858
86	1,72	1,184	-2,017	24,249	24,293
87	1,74	1,153	-1,723	25,643	25,676
88	1,76	1,216	-1,926	24,462	24,504
89	1,78	1,188	-1,956	24,586	24,628
90	1,80	1,167	-1,843	25,389	25,426
91	1,82	1,226	-1,892	24,423	24,464
92	1,84	1,212	-1,477	24,650	24,680
93	1,86	1,217	-1,586	25,596	25,628
94	1,88	1,178	-1,789	23,976	24,014
95	1,90	1,226	-1,731	25,072	25,108
96	1,92	1,166	-1,714	25,227	25,260
97	1,94	1,161	-1,557	24,370	24,401
98	1,96	1,204	-1,555	24,982	25,013
99	1,98	1,160	-1,167	25,224	25,247
100	2,00	1,152	-1,355	24,167	24,194

101	2,02	1,175	-1,615	25,234	25,266
102	2,04	1,145	-1,489	25,158	25,186
103	2,06	1,126	-1,456	24,228	24,256
104	2,08	1,132	-1,656	25,341	25,373
105	2,10	1,097	-1,439	25,017	25,043
106	2,12	1,156	-1,552	24,483	24,514
107	2,14	1,100	-1,131	25,470	25,491
108	2,16	1,120	-1,049	24,977	24,997
109	2,18	1,150	-1,141	24,804	24,826
110	2,20	1,125	-1,194	25,181	25,203
111	2,22	1,082	-1,648	24,736	24,767
112	2,24	1,097	-1,349	24,638	24,663
113	2,26	1,099	-1,158	25,366	25,387
114	2,28	1,090	-0,963	24,704	24,722
115	2,30	1,104	-1,151	25,015	25,036
116	2,32	1,083	-1,290	25,422	25,445
117	2,34	1,105	-1,284	24,942	24,966
118	2,36	1,058	-1,208	25,335	25,356
119	2,38	1,106	-1,134	25,645	25,665
120	2,40	1,110	-1,423	24,774	24,800
121	2,42	1,086	-1,288	25,108	25,131
122	2,44	1,123	-1,313	25,340	25,364
123	2,46	1,126	-1,457	24,942	24,970
124	2,48	1,086	-1,548	25,581	25,609
125	2,50	1,040	-1,528	25,410	25,436
126	2,52	1,117	-1,842	25,056	25,092
127	2,54	1,165	-1,434	25,518	25,545
128	2,56	1,128	-1,876	25,285	25,322
129	2,58	1,131	-1,785	24,900	24,935
130	2,60	1,148	-1,964	25,161	25,201
131	2,62	1,111	-1,867	25,076	25,113
132	2,64	1,159	-1,989	25,238	25,279
133	2,66	1,142	-1,630	25,600	25,631
134	2,68	1,194	-1,676	25,206	25,239
135	2,70	1,211	-1,448	25,204	25,233
136	2,72	1,197	-2,214	25,113	25,162
137	2,74	1,205	-2,164	24,961	25,009
138	2,76	1,177	-1,949	25,007	25,047
139	2,78	1,184	-2,004	25,079	25,121
140	2,80	1,233	-1,695	24,777	24,813
141	2,82	1,233	-1,980	24,910	24,952
142	2,84	1,194	-2,289	24,674	24,726
143	2,86	1,213	-1,824	24,634	24,672
144	2,88	1,225	-2,049	24,942	24,986
145	2,90	1,216	-2,158	24,926	24,974
146	2,92	1,256	-2,099	24,810	24,857
147	2,94	1,227	-2,105	25,196	25,242
148	2,96	1,251	-1,933	24,772	24,815
149	2,98	1,255	-2,007	24,749	24,793
150	3,00	1,268	-1,630	24,828	24,863

151	3,02	1,273	-1,805	24,766	24,805
152	3,04	1,301	-1,983	25,121	25,165
153	3,06	1,260	-1,981	25,068	25,112
154	3,08	1,288	-2,212	24,794	24,846
155	3,10	1,301	-1,932	24,672	24,716
156	3,12	1,323	-2,190	24,769	24,821
157	3,14	1,297	-1,779	24,757	24,797
158	3,16	1,338	-2,003	24,955	25,001
159	3,18	1,291	-1,893	24,873	24,915
160	3,20	1,248	-2,044	24,809	24,854
161	3,22	1,260	-2,114	24,825	24,872
162	3,24	1,280	-2,137	24,761	24,810
163	3,26	1,285	-2,067	24,630	24,677
164	3,28	1,266	-2,080	24,696	24,743
165	3,30	1,238	-1,935	25,011	25,052
166	3,32	1,260	-2,242	24,882	24,934
167	3,34	1,251	-2,153	24,910	24,959
168	3,36	1,278	-1,985	24,660	24,705
169	3,38	1,302	-1,918	24,922	24,965
170	3,40	1,287	-2,350	24,857	24,913
171	3,42	1,246	-2,312	24,994	25,048
172	3,44	1,307	-2,501	24,911	24,973
173	3,46	1,251	-2,205	24,975	25,025
174	3,48	1,277	-2,274	24,935	24,988
175	3,50	1,249	-1,958	24,792	24,835
176	3,52	1,244	-2,100	24,881	24,927
177	3,54	1,220	-1,977	24,873	24,915
178	3,56	1,254	-2,112	24,891	24,938
179	3,58	1,278	-2,040	24,883	24,929
180	3,60	1,188	-2,289	24,778	24,830
181	3,62	1,218	-2,187	24,844	24,893
182	3,64	1,253	-2,057	24,921	24,966
183	3,66	1,247	-1,923	24,966	25,008
184	3,68	1,240	-2,145	24,978	25,025
185	3,70	1,218	-2,123	24,934	24,981
186	3,72	1,218	-2,468	24,821	24,879
187	3,74	1,235	-2,659	25,095	25,160
188	3,76	1,231	-1,919	24,986	25,027
189	3,78	1,248	-2,354	25,064	25,119
190	3,80	1,216	-2,197	24,985	25,034
191	3,82	1,191	-2,199	25,109	25,157
192	3,84	1,194	-2,262	25,380	25,429
193	3,86	1,175	-2,303	25,087	25,138
194	3,88	1,159	-2,367	25,056	25,109
195	3,90	1,232	-2,429	25,042	25,099
196	3,92	1,192	-2,290	25,278	25,328
197	3,94	1,235	-2,401	25,171	25,226
198	3,96	1,237	-2,221	25,379	25,428
199	3,98	1,202	-2,691	25,108	25,173
200	4,00	1,201	-2,529	25,037	25,096

201	4,02	1,190	-2,648	24,999	25,063
202	4,04	1,232	-2,309	25,109	25,162
203	4,06	1,208	-2,413	25,152	25,208
204	4,08	1,259	-2,269	25,247	25,299
205	4,10	1,205	-2,247	24,951	25,001
206	4,12	1,249	-2,254	24,960	25,011
207	4,14	1,214	-1,925	24,953	24,994
208	4,16	1,257	-2,265	25,133	25,185
209	4,18	1,278	-2,519	25,118	25,179
210	4,20	1,239	-2,597	25,028	25,091
211	4,22	1,295	-2,149	25,025	25,075
212	4,24	1,246	-2,431	25,102	25,159
213	4,26	1,251	-2,317	25,223	25,276
214	4,28	1,237	-2,332	25,241	25,294
215	4,30	1,254	-1,932	25,020	25,062
216	4,32	1,253	-2,425	24,646	24,704
217	4,34	1,232	-2,381	25,072	25,127
218	4,36	1,310	-2,329	25,114	25,169
219	4,38	1,265	-1,841	25,182	25,222
220	4,40	1,194	-2,243	25,183	25,232
221	4,42	1,233	-2,268	25,021	25,073
222	4,44	1,229	-2,370	25,026	25,081
223	4,46	1,254	-2,113	24,981	25,029
224	4,48	1,255	-2,109	25,320	25,367
225	4,50	1,306	-2,070	25,000	25,047
226	4,52	1,289	-2,317	24,923	24,978
227	4,54	1,252	-2,459	25,037	25,095
228	4,56	1,275	-2,175	24,664	24,715
229	4,58	1,258	-1,927	25,270	25,311
230	4,60	1,184	-2,226	24,775	24,825
231	4,62	1,257	-2,102	24,929	24,976
232	4,64	1,220	-2,665	24,943	25,008
233	4,66	1,221	-2,451	25,135	25,192
234	4,68	1,256	-2,320	24,708	24,762
235	4,70	1,221	-2,153	24,898	24,946
236	4,72	1,229	-2,631	24,865	24,930
237	4,74	1,232	-2,495	24,908	24,968
238	4,76	1,254	-2,899	25,024	25,100
239	4,78	1,234	-2,330	25,238	25,291
240	4,80	1,209	-2,618	24,833	24,897
241	4,82	1,254	-1,857	25,382	25,421
242	4,84	1,225	-2,454	25,107	25,164
243	4,86	1,220	-2,337	25,060	25,113
244	4,88	1,223	-2,961	24,993	25,070
245	4,90	1,210	-2,197	24,921	24,970
246	4,92	1,186	-2,598	24,808	24,870
247	4,94	1,239	-2,131	25,018	25,065
248	4,96	1,203	-2,472	24,899	24,957
249	4,98	1,311	-2,212	25,262	25,313
250	5,00	1,281	-2,538	24,640	24,703



Berdasarkan grafik diatas, nilai tahanan model kapal untuk F_n 0,213 terjadi pada waktu 4,0 – 4,5 s. Sehingga apabila dirata – ratakan nilai tahanan model kapal 2,556 N.

- dp 0,005

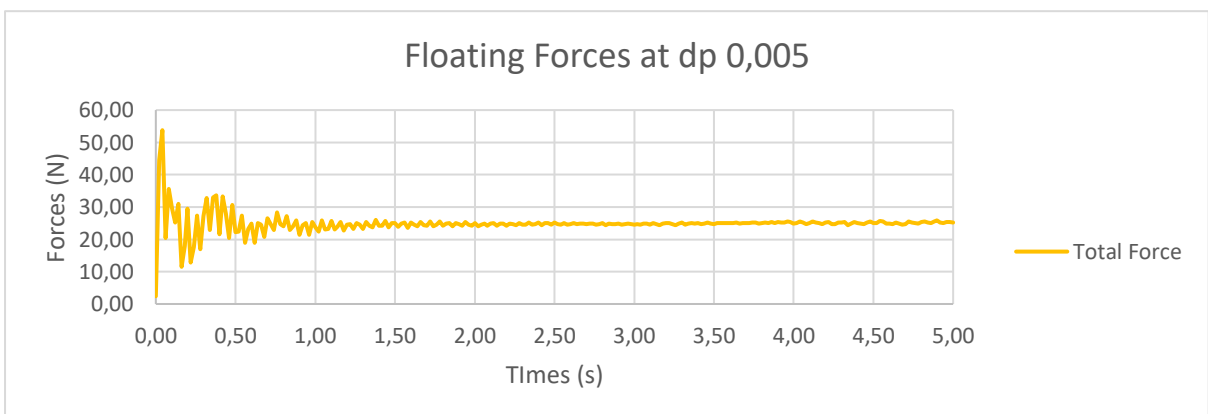
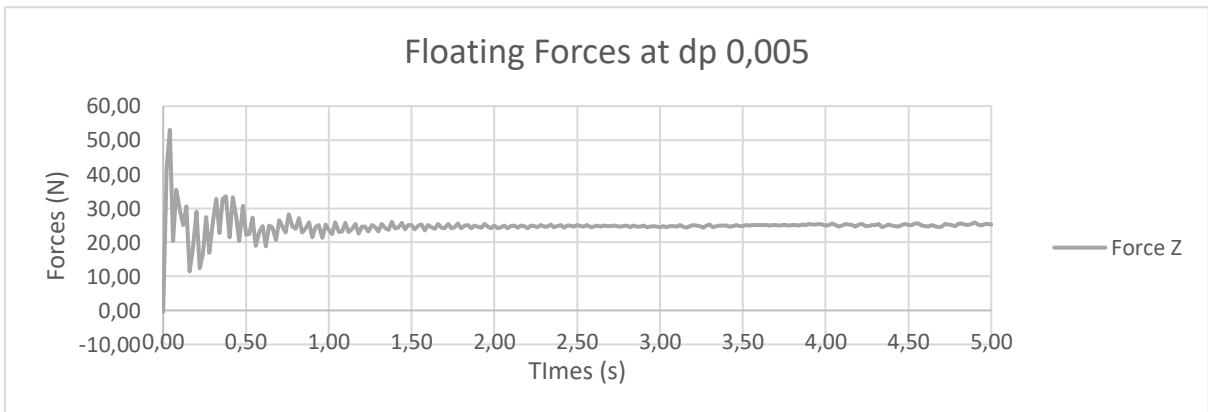
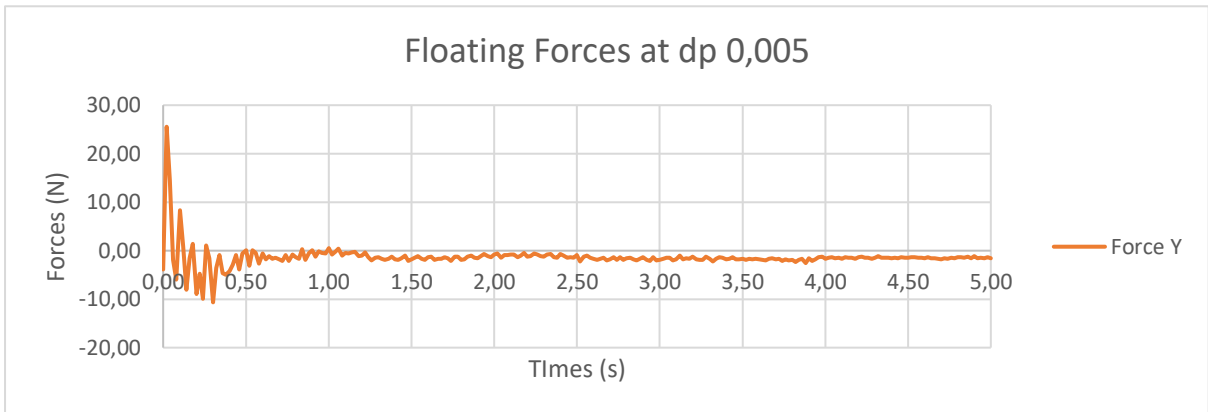
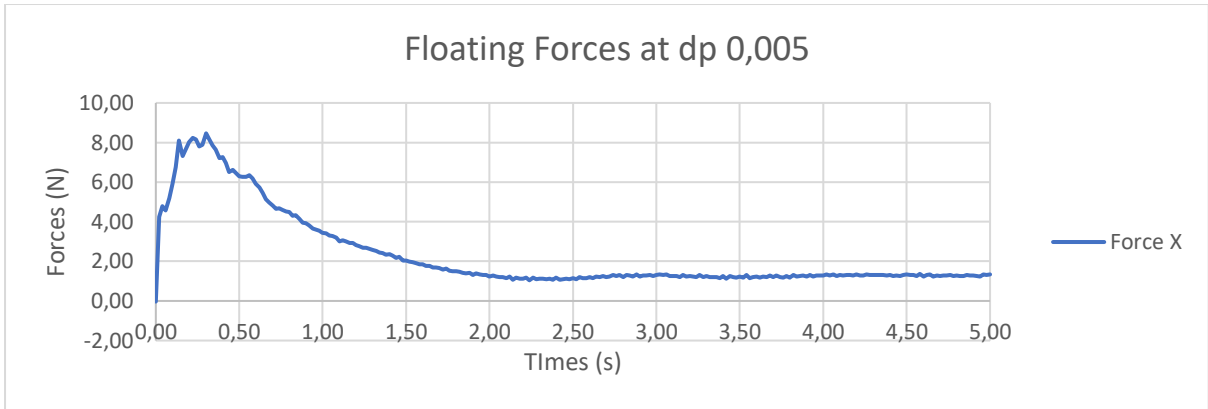
Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	-0,031	-3,925	-0,412	2,395
1	0,02	4,261	25,557	41,769	44,517
2	0,04	4,779	14,467	53,039	53,779
3	0,06	4,575	-1,920	20,363	20,442
4	0,08	5,181	-6,004	35,483	35,676
5	0,10	5,922	8,365	29,230	29,699
6	0,12	6,752	0,899	25,115	25,140
7	0,14	8,100	-8,092	30,499	30,898
8	0,16	7,305	-1,566	11,368	11,433
9	0,18	7,658	1,347	17,846	17,882
10	0,20	8,006	-8,962	29,037	29,553
11	0,22	8,231	-4,761	12,422	12,771
12	0,24	8,154	-9,947	16,621	17,672
13	0,26	7,811	1,024	27,356	27,381
14	0,28	7,892	-1,584	16,959	17,010
15	0,30	8,463	-10,661	26,333	27,104
16	0,32	8,144	-3,562	32,739	32,813
17	0,34	7,864	-0,901	22,791	22,820
18	0,36	7,634	-4,656	32,789	32,923
19	0,38	7,212	-5,014	33,471	33,619
20	0,40	7,261	-4,175	21,470	21,630
21	0,42	6,962	-2,903	33,236	33,295
22	0,44	6,511	-0,946	27,942	27,964
23	0,46	6,618	-3,844	20,300	20,444
24	0,48	6,445	-0,633	30,669	30,682
25	0,50	6,306	0,133	22,187	22,197
26	0,52	6,275	-3,149	22,384	22,474
27	0,54	6,267	0,064	27,284	27,291
28	0,56	6,360	-0,461	18,916	18,925
29	0,58	6,188	-2,665	23,118	23,180
30	0,60	5,905	-0,568	24,803	24,812
31	0,62	5,730	-1,795	18,884	18,923
32	0,64	5,458	-1,083	24,965	24,982
33	0,66	5,139	-1,673	24,491	24,522
34	0,68	4,980	-1,485	20,702	20,731
35	0,70	4,812	-1,768	26,532	26,561
36	0,72	4,644	-2,163	24,619	24,661
37	0,74	4,667	-0,893	22,944	22,960
38	0,76	4,596	-2,077	28,273	28,307
39	0,78	4,516	-0,764	24,663	24,673
40	0,80	4,501	-1,396	24,018	24,041
41	0,82	4,315	-1,685	27,076	27,102
42	0,84	4,326	0,266	22,885	22,894
43	0,86	4,133	-1,879	23,993	24,026
44	0,88	3,960	-0,472	25,926	25,934
45	0,90	3,935	0,133	21,452	21,462
46	0,92	3,820	-1,282	24,409	24,428
47	0,94	3,656	-0,086	25,098	25,105
48	0,96	3,605	-0,487	21,358	21,367
49	0,98	3,545	-0,593	25,277	25,287
50	1,00	3,449	0,551	23,692	23,701

51	1,02	3,405	-0,808	22,340	22,352
52	1,04	3,313	-0,281	25,785	25,791
53	1,06	3,277	0,430	23,103	23,112
54	1,08	3,195	-1,059	23,197	23,213
55	1,10	3,018	-0,501	25,710	25,718
56	1,12	3,063	-0,616	23,009	23,018
57	1,14	3,021	-0,310	23,898	23,906
58	1,16	2,933	-0,262	25,360	25,366
59	1,18	2,932	-1,153	22,642	22,659
60	1,20	2,826	-1,046	24,530	24,546
61	1,22	2,768	-0,326	24,659	24,666
62	1,24	2,685	-1,306	23,121	23,142
63	1,26	2,695	-1,959	25,002	25,035
64	1,28	2,623	-1,451	24,516	24,539
65	1,30	2,591	-1,377	23,260	23,282
66	1,32	2,519	-1,658	25,410	25,436
67	1,34	2,430	-1,898	24,141	24,174
68	1,36	2,421	-1,671	23,695	23,724
69	1,38	2,329	-1,266	26,007	26,025
70	1,40	2,374	-1,749	24,135	24,164
71	1,42	2,291	-1,936	24,237	24,271
72	1,44	2,186	-1,602	25,641	25,666
73	1,46	2,226	-1,050	23,750	23,767
74	1,48	2,048	-2,085	25,036	25,074
75	1,50	2,047	-1,804	25,089	25,118
76	1,52	1,985	-1,473	23,878	23,903
77	1,54	1,969	-1,128	24,932	24,948
78	1,56	1,918	-1,729	25,210	25,238
79	1,58	1,846	-1,910	23,536	23,571
80	1,60	1,851	-1,393	25,140	25,162
81	1,62	1,760	-1,289	24,500	24,521
82	1,64	1,760	-1,852	24,027	24,060
83	1,66	1,678	-1,700	25,377	25,404
84	1,68	1,694	-1,629	24,363	24,390
85	1,70	1,658	-1,325	24,130	24,152
86	1,72	1,583	-1,519	25,447	25,469
87	1,74	1,648	-2,070	24,063	24,102
88	1,76	1,526	-1,256	24,481	24,500
89	1,78	1,506	-1,191	25,468	25,486
90	1,80	1,507	-1,894	24,167	24,201
91	1,82	1,462	-1,786	24,845	24,875
92	1,84	1,424	-1,267	25,096	25,116
93	1,86	1,385	-0,996	24,090	24,106
94	1,88	1,420	-1,492	24,964	24,987
95	1,90	1,321	-1,532	24,672	24,696
96	1,92	1,384	-1,165	24,267	24,285
97	1,94	1,339	-0,659	25,393	25,404
98	1,96	1,316	-1,136	24,540	24,556
99	1,98	1,325	-1,386	24,201	24,222
100	2,00	1,219	-0,749	24,943	24,955

101	2,02	1,277	-0,536	24,094	24,104
102	2,04	1,241	-1,495	24,448	24,471
103	2,06	1,211	-0,942	24,859	24,873
104	2,08	1,194	-0,915	24,196	24,211
105	2,10	1,151	-0,804	24,834	24,846
106	2,12	1,224	-0,840	24,962	24,974
107	2,14	1,078	-1,372	24,235	24,255
108	2,16	1,185	-0,984	24,938	24,952
109	2,18	1,122	-0,504	24,838	24,848
110	2,20	1,132	-1,193	24,169	24,187
111	2,22	1,168	-1,156	24,912	24,928
112	2,24	1,043	-0,611	24,762	24,772
113	2,26	1,173	-0,765	24,420	24,432
114	2,28	1,086	-1,097	25,049	25,064
115	2,30	1,126	-1,252	24,550	24,568
116	2,32	1,121	-0,796	24,587	24,599
117	2,34	1,088	-0,726	25,211	25,221
118	2,36	1,129	-1,393	24,499	24,520
119	2,38	1,078	-1,486	24,757	24,780
120	2,40	1,171	-0,708	25,132	25,143
121	2,42	1,069	-1,073	24,327	24,342
122	2,44	1,109	-1,411	24,941	24,962
123	2,46	1,116	-1,378	24,961	24,981
124	2,48	1,099	-1,483	24,572	24,595
125	2,50	1,163	-0,916	25,106	25,120
126	2,52	1,090	-2,179	24,733	24,774
127	2,54	1,194	-1,260	24,529	24,547
128	2,56	1,152	-1,005	25,078	25,093
129	2,58	1,163	-1,497	24,500	24,525
130	2,60	1,200	-1,668	24,620	24,648
131	2,62	1,145	-1,891	24,970	25,003
132	2,64	1,234	-1,630	24,602	24,631
133	2,66	1,206	-1,462	24,885	24,909
134	2,68	1,271	-2,034	24,799	24,836
135	2,70	1,195	-1,756	24,727	24,758
136	2,72	1,237	-1,350	24,844	24,866
137	2,74	1,306	-1,911	24,834	24,870
138	2,76	1,246	-1,370	24,585	24,607
139	2,78	1,313	-1,928	24,710	24,745
140	2,80	1,217	-1,534	24,961	24,988
141	2,82	1,304	-1,457	24,372	24,397
142	2,84	1,279	-1,778	24,868	24,900
143	2,86	1,241	-2,035	24,651	24,689
144	2,88	1,332	-1,693	24,657	24,688
145	2,90	1,232	-1,294	24,844	24,867
146	2,92	1,294	-1,848	24,524	24,557
147	2,94	1,291	-2,077	24,606	24,645
148	2,96	1,299	-1,363	24,814	24,838
149	2,98	1,264	-1,978	24,662	24,700
150	3,00	1,311	-1,864	24,450	24,484

151	3,02	1,337	-1,672	24,694	24,722
152	3,04	1,302	-1,435	24,455	24,481
153	3,06	1,343	-1,408	24,803	24,828
154	3,08	1,264	-2,007	24,763	24,800
155	3,10	1,262	-1,768	24,578	24,610
156	3,12	1,268	-1,056	25,036	25,055
157	3,14	1,213	-1,751	24,629	24,661
158	3,16	1,309	-1,559	24,313	24,339
159	3,18	1,224	-1,650	24,833	24,861
160	3,20	1,252	-1,185	25,007	25,028
161	3,22	1,235	-1,770	24,961	24,993
162	3,24	1,199	-1,899	24,705	24,739
163	3,26	1,311	-1,860	24,356	24,390
164	3,28	1,197	-1,208	24,895	24,916
165	3,30	1,260	-1,646	25,219	25,247
166	3,32	1,213	-2,190	24,494	24,537
167	3,34	1,197	-1,665	24,821	24,849
168	3,36	1,206	-1,381	24,961	24,983
169	3,38	1,163	-1,472	24,900	24,925
170	3,40	1,270	-1,819	24,948	24,980
171	3,42	1,126	-1,692	24,644	24,673
172	3,44	1,251	-1,390	24,781	24,803
173	3,46	1,195	-1,774	25,126	25,157
174	3,48	1,184	-1,820	24,838	24,870
175	3,50	1,229	-1,680	24,739	24,768
176	3,52	1,164	-1,885	25,015	25,049
177	3,54	1,300	-1,672	24,938	24,966
178	3,56	1,145	-1,764	25,080	25,111
179	3,58	1,210	-1,646	25,000	25,027
180	3,60	1,221	-1,789	25,009	25,042
181	3,62	1,181	-1,902	25,004	25,038
182	3,64	1,236	-1,979	25,089	25,125
183	3,66	1,198	-1,683	24,880	24,908
184	3,68	1,286	-1,622	25,002	25,031
185	3,70	1,198	-1,741	25,072	25,102
186	3,72	1,287	-1,630	24,947	24,974
187	3,74	1,208	-2,101	25,146	25,187
188	3,76	1,188	-1,806	25,116	25,149
189	3,78	1,264	-1,988	24,893	24,931
190	3,80	1,182	-1,890	25,028	25,062
191	3,82	1,322	-2,338	25,071	25,119
192	3,84	1,232	-1,871	24,939	24,975
193	3,86	1,254	-1,670	25,261	25,290
194	3,88	1,272	-2,560	25,014	25,069
195	3,90	1,242	-1,525	25,326	25,351
196	3,92	1,311	-2,091	25,176	25,218
197	3,94	1,241	-1,747	25,163	25,194
198	3,96	1,290	-1,306	25,440	25,488
199	3,98	1,277	-1,271	25,287	25,329
200	4,00	1,274	-1,719	24,850	24,912

201	4,02	1,350	-1,454	25,006	25,059
202	4,04	1,273	-1,375	25,498	25,549
203	4,06	1,335	-1,558	25,106	25,161
204	4,08	1,247	-1,490	24,612	24,665
205	4,10	1,310	-1,637	24,954	25,016
206	4,12	1,297	-1,295	25,444	25,492
207	4,14	1,299	-1,464	25,176	25,229
208	4,16	1,310	-1,457	25,023	25,072
209	4,18	1,274	-1,675	24,582	24,648
210	4,20	1,332	-1,347	25,170	25,220
211	4,22	1,294	-1,290	25,365	25,412
212	4,24	1,293	-1,446	24,714	24,764
213	4,26	1,339	-1,418	24,727	24,776
214	4,28	1,310	-1,662	25,121	25,186
215	4,30	1,320	-1,494	25,065	25,121
216	4,32	1,300	-1,172	25,387	25,426
217	4,34	1,324	-1,469	24,383	24,435
218	4,36	1,316	-1,436	24,739	24,791
219	4,38	1,294	-1,461	25,261	25,315
220	4,40	1,306	-1,552	24,931	24,991
221	4,42	1,262	-1,450	24,779	24,828
222	4,44	1,290	-1,522	24,663	24,719
223	4,46	1,264	-1,385	25,116	25,165
224	4,48	1,306	-1,464	25,409	25,457
225	4,50	1,332	-1,507	25,030	25,081
226	4,52	1,317	-1,382	25,022	25,068
227	4,54	1,314	-1,332	25,592	25,641
228	4,56	1,264	-1,408	25,550	25,602
229	4,58	1,375	-1,458	24,889	24,940
230	4,60	1,219	-1,550	24,838	24,894
231	4,62	1,312	-1,398	24,663	24,718
232	4,64	1,332	-1,568	25,065	25,122
233	4,66	1,241	-1,609	24,804	24,863
234	4,68	1,290	-1,663	24,471	24,532
235	4,70	1,266	-1,838	24,558	24,633
236	4,72	1,290	-1,571	25,418	25,478
237	4,74	1,288	-1,645	25,187	25,247
238	4,76	1,317	-1,476	25,059	25,108
239	4,78	1,262	-1,562	24,774	24,831
240	4,80	1,293	-1,396	25,375	25,426
241	4,82	1,264	-1,354	25,491	25,538
242	4,84	1,270	-1,454	25,225	25,273
243	4,86	1,325	-1,230	25,025	25,065
244	4,88	1,296	-1,545	25,451	25,506
245	4,90	1,286	-1,162	25,864	25,901
246	4,92	1,260	-1,545	25,170	25,221
247	4,94	1,236	-1,412	24,991	25,038
248	4,96	1,348	-1,544	25,359	25,416
249	4,98	1,311	-1,391	25,351	25,401
250	5,00	1,328	-1,616	25,173	25,231



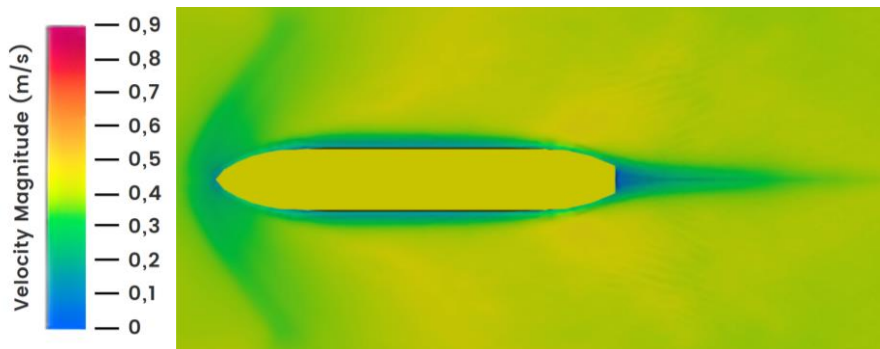
Berdasarkan grafik diatas, nilai tahanan model kapal untuk $F_n 0,213$ terjadi pada waktu 2,5 – 3,0 s. Sehingga apabila dirata – rata nilai tahanan model kapal 2,475 N.

LAMPIRAN 4

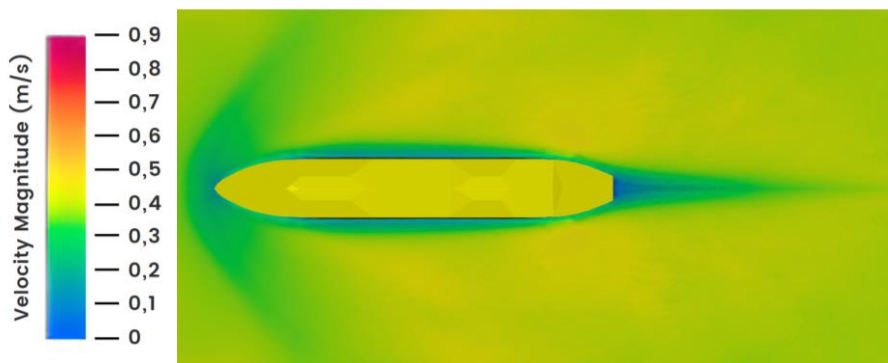
Lampiran 4.

Visualisasi *velocity magnitude*

- Kecepatan 0,406 m/s

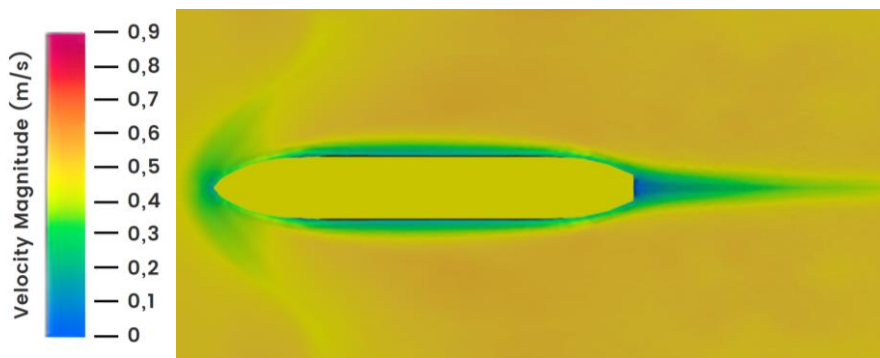


(a) model kapal yang menggunakan *bulbous bow*

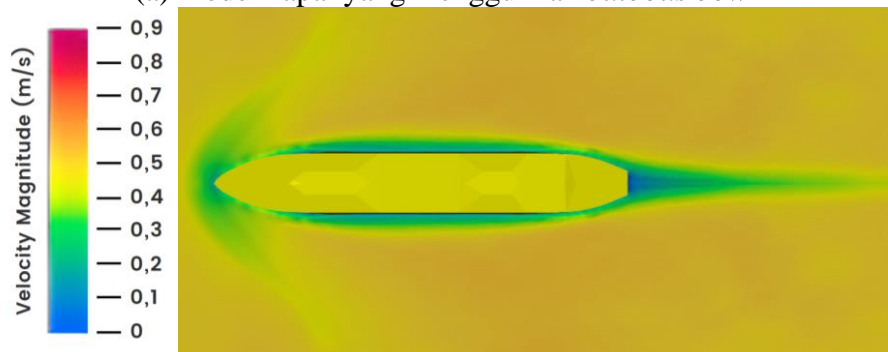


(b) model kapal tanpa *bulbous bow*

- Kecepatan 0,488 m/s

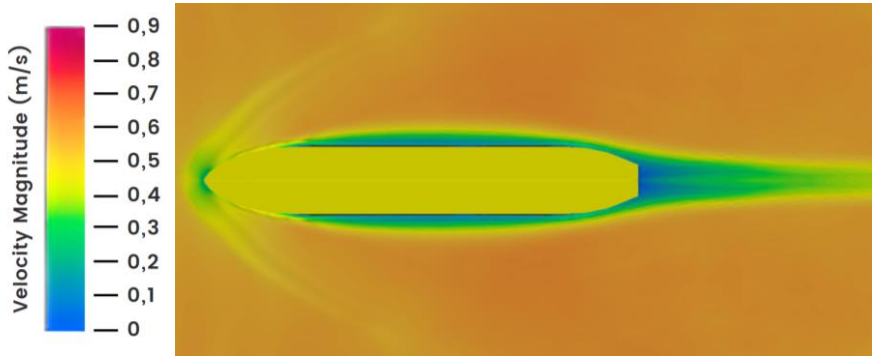


(a) model kapal yang menggunakan *bulbous bow*

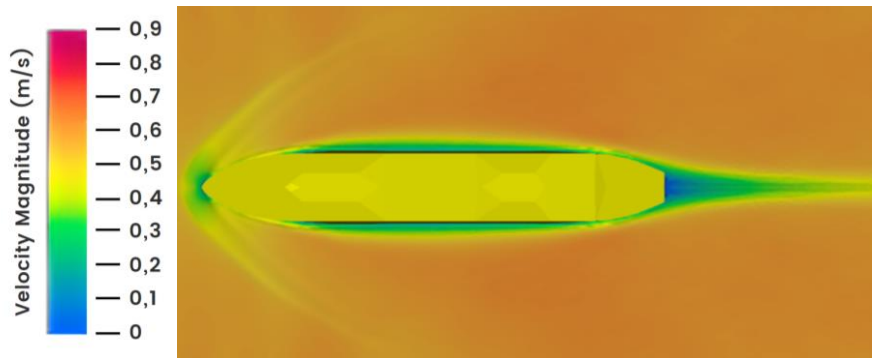


(b) model kapal tanpa *bulbous bow*

- Kecepatan 0,569 m/s

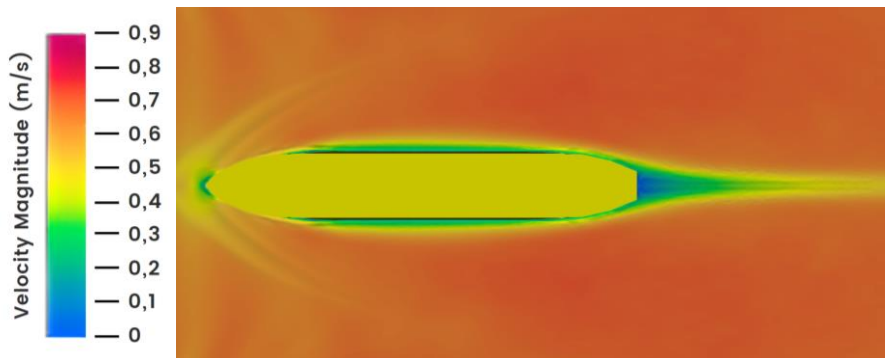


(a) model kapal yang menggunakan *bulbous bow*

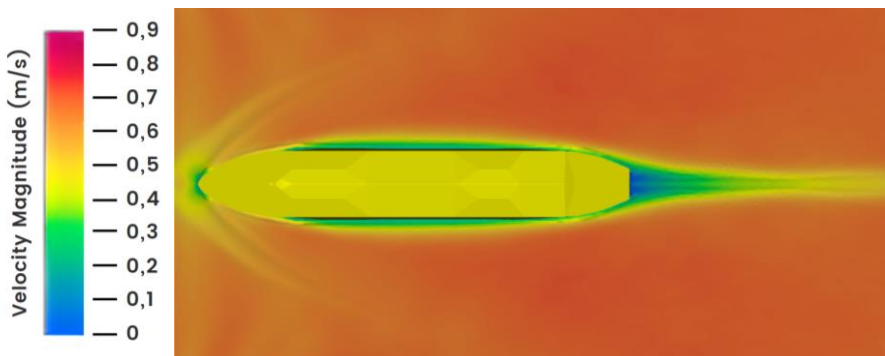


(b) model kapal tanpa *bulbous bow*

- Kecepatan 0,650 m/s

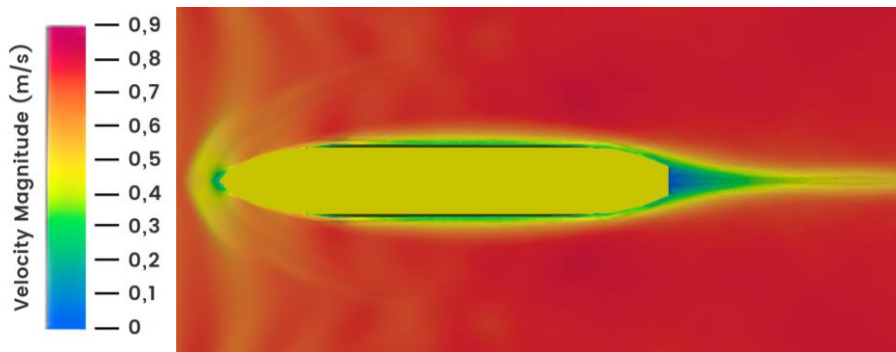


(a) model kapal yang menggunakan *bulbous bow*

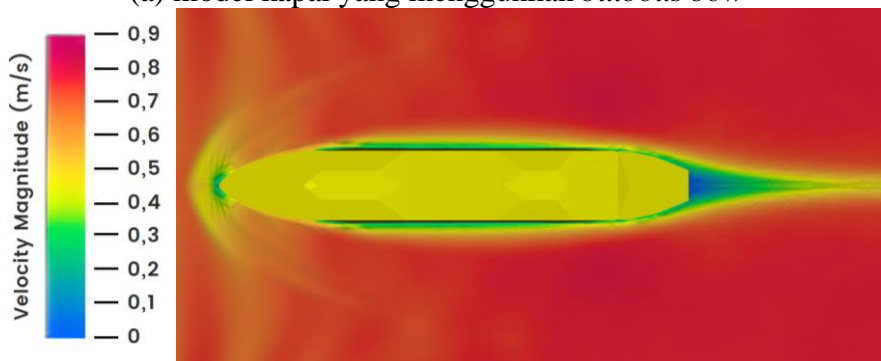


(b) model kapal tanpa *bulbous bow*

- Kecepatan 0,732 m/s

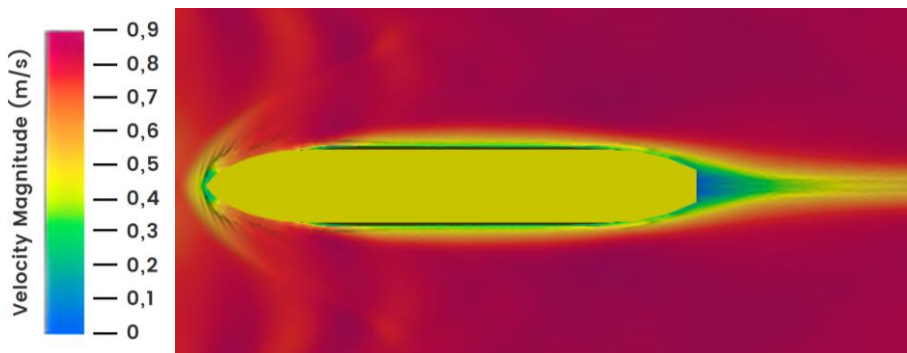


(a) model kapal yang menggunakan *bulbous bow*

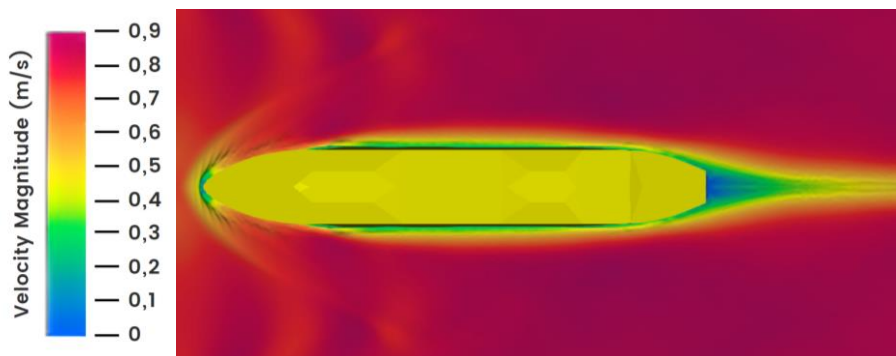


(b) model kapal tanpa *bulbous bow*

- Kecepatan 0,813 m/s

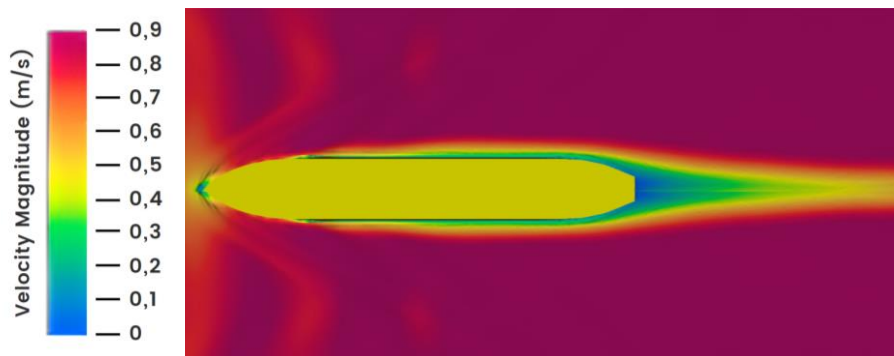


(a) model kapal yang menggunakan *bulbous bow*

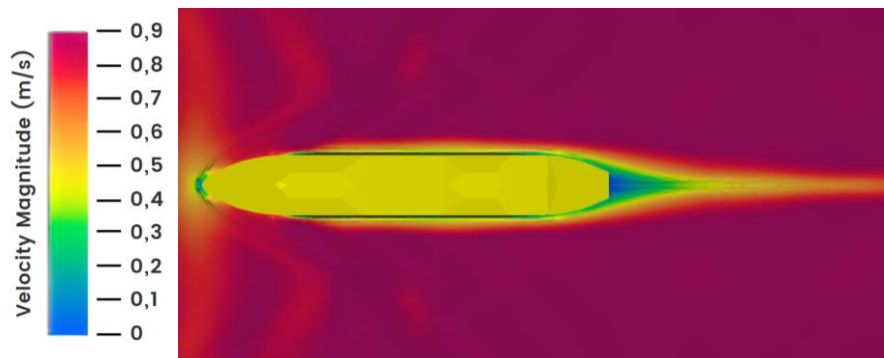


(b) model kapal tanpa *bulbous bow*

- Kecepatan 0,894 m/s



(a) model kapal yang menggunakan *bulbous bow*



(b) model kapal tanpa *bulbous bow*

LAMPIRAN 5

Lampiran 5.

Penentuan nilai tahanan model kapal yang menggunakan *bulbous bow* pada tiap variasi kecepatan.

- Kecepatan 0,406 m/s

Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	1,935	-1,345	-0,633	1,499
1	0,02	-3,652	-9,657	33,950	34,293
2	0,04	7,944	3,910	26,620	26,695
3	0,06	7,625	10,606	26,660	28,702
4	0,08	7,566	-2,359	29,139	29,182
5	0,10	7,009	0,757	31,097	31,101
6	0,12	7,124	2,651	21,338	21,507
7	0,14	7,209	9,661	27,240	27,665
8	0,16	7,149	3,946	20,070	20,167
9	0,18	6,797	5,455	21,106	21,804
10	0,20	6,931	-1,501	30,620	30,637
11	0,22	6,734	-1,780	30,855	30,907
12	0,24	6,628	-3,611	16,803	17,187
13	0,26	6,834	-2,242	27,972	28,012
14	0,28	6,924	-2,479	29,047	29,155
15	0,30	6,833	-1,932	17,077	17,192
16	0,32	6,578	-0,943	39,360	39,376
17	0,34	6,365	-0,584	22,931	22,944
18	0,36	6,637	1,118	16,640	16,682
19	0,38	6,685	-0,025	35,010	35,015
20	0,40	6,326	1,522	17,931	18,000
21	0,42	6,193	1,067	16,125	16,163
22	0,44	6,648	0,634	31,817	31,826
23	0,46	6,497	0,675	14,794	14,814
24	0,48	6,296	-0,281	15,429	15,434
25	0,50	6,100	-0,086	29,567	29,570
26	0,52	6,137	-0,103	11,642	11,647
27	0,54	6,082	-1,085	16,514	16,553
28	0,56	6,058	-0,064	27,147	27,149
29	0,58	5,943	-0,047	10,875	10,879
30	0,60	5,748	-0,502	18,270	18,279
31	0,62	5,455	0,327	25,877	25,880
32	0,64	5,467	-0,662	11,947	11,968
33	0,66	5,161	-0,488	21,617	21,624
34	0,68	5,209	-0,328	26,912	26,914
35	0,70	5,051	-1,098	14,668	14,710
36	0,72	4,833	-0,199	25,966	25,968
37	0,74	4,467	-0,165	27,773	27,774
38	0,76	4,466	-0,593	16,948	16,961
39	0,78	4,140	0,006	28,282	28,283
40	0,80	4,315	0,044	26,791	26,792
41	0,82	4,174	-0,170	17,918	17,922
42	0,84	4,303	0,440	29,072	29,077
43	0,86	4,042	0,373	24,714	24,719
44	0,88	3,963	0,157	18,826	18,829
45	0,90	3,941	0,542	29,233	29,239
46	0,92	3,620	0,335	23,397	23,401
47	0,94	3,985	0,195	20,136	20,139
48	0,96	3,792	0,455	29,797	29,802
49	0,98	3,013	0,069	23,120	23,122
50	1,00	3,299	-0,025	22,334	22,335

51	1,02	3,524	0,107	31,224	31,225
52	1,04	3,024	-0,158	23,260	23,261
53	1,06	2,539	-0,236	25,355	25,357
54	1,08	2,722	-0,076	31,587	31,588
55	1,10	2,529	-0,394	23,263	23,267
56	1,12	2,341	-0,268	26,634	26,635
57	1,14	2,390	0,051	30,025	30,025
58	1,16	2,135	-0,419	21,969	21,974
59	1,18	1,970	-0,156	25,973	25,974
60	1,20	1,826	-0,062	27,644	27,645
61	1,22	1,928	-0,397	20,225	20,230
62	1,24	1,981	-0,115	25,553	25,554
63	1,26	1,701	-0,103	25,597	25,597
64	1,28	1,632	-0,299	20,077	20,080
65	1,30	1,606	-0,199	25,954	25,955
66	1,32	1,597	-0,334	25,004	25,007
67	1,34	1,618	-0,470	20,827	20,832
68	1,36	1,709	-0,369	26,820	26,823
69	1,38	1,680	-0,473	24,333	24,338
70	1,40	1,644	-0,462	21,272	21,277
71	1,42	1,485	-0,233	26,631	26,633
72	1,44	1,573	-0,270	22,811	22,814
73	1,46	1,767	-0,253	21,089	21,091
74	1,48	1,444	-0,001	25,415	25,415
75	1,50	1,935	-0,329	21,592	21,595
76	1,52	1,680	-0,160	20,621	20,622
77	1,54	1,919	-0,109	24,751	24,752
78	1,56	1,732	-0,260	20,457	20,460
79	1,58	1,733	-0,161	21,018	21,020
80	1,60	1,715	-0,157	24,698	24,699
81	1,62	1,743	-0,166	20,224	20,226
82	1,64	1,872	-0,118	22,040	22,041
83	1,66	1,921	-0,108	24,649	24,650
84	1,68	1,973	-0,171	20,481	20,483
85	1,70	1,671	-0,225	23,035	23,036
86	1,72	1,526	-0,074	24,617	24,618
87	1,74	1,839	-0,335	20,743	20,746
88	1,76	1,931	-0,160	23,471	23,473
89	1,78	1,507	-0,177	24,166	24,167
90	1,80	1,556	-0,298	20,732	20,735
91	1,82	1,545	-0,114	23,873	23,874
92	1,84	1,435	-0,167	23,768	23,769
93	1,86	1,538	-0,072	20,743	20,745
94	1,88	1,213	-0,120	24,419	24,421
95	1,90	1,270	-0,087	23,146	23,148
96	1,92	1,267	-0,194	21,257	21,259
97	1,94	1,244	-0,052	24,821	24,822
98	1,96	1,258	-0,106	23,567	23,568
99	1,98	1,269	-0,299	22,199	22,202
100	2,00	1,150	-0,236	25,452	25,454

101	2,02	1,205	-0,118	23,673	23,674
102	2,04	1,278	-0,265	22,988	22,991
103	2,06	1,275	-0,115	25,798	25,800
104	2,08	1,257	-0,209	23,626	23,628
105	2,10	1,445	-0,064	23,660	23,662
106	2,12	1,351	-0,006	25,718	25,720
107	2,14	1,351	-0,200	23,516	23,518
108	2,16	1,204	-0,104	24,104	24,106
109	2,18	1,128	-0,160	25,934	25,936
110	2,20	1,228	-0,258	23,582	23,585
111	2,22	1,225	-0,170	24,434	24,436
112	2,24	1,254	-0,076	25,815	25,817
113	2,26	1,314	-0,235	23,605	23,608
114	2,28	1,274	0,010	24,768	24,770
115	2,30	1,158	-0,031	25,455	25,457
116	2,32	1,211	-0,285	23,326	23,330
117	2,34	1,149	0,095	24,529	24,531
118	2,36	1,261	-0,154	24,466	24,468
119	2,38	1,196	-0,054	22,901	22,903
120	2,40	1,167	-0,103	24,689	24,691
121	2,42	1,090	-0,216	24,128	24,131
122	2,44	1,229	0,035	22,727	22,729
123	2,46	1,169	-0,178	24,208	24,210
124	2,48	1,055	-0,189	23,672	23,674
125	2,50	0,966	-0,426	22,782	22,788
126	2,52	0,934	-0,342	24,107	24,110
127	2,54	0,940	-0,280	23,372	23,375
128	2,56	0,775	-0,321	22,792	22,796
129	2,58	0,885	-0,256	24,153	24,156
130	2,60	0,832	-0,388	22,583	22,588
131	2,62	0,741	-0,360	22,834	22,838
132	2,64	0,766	-0,291	23,646	23,649
133	2,66	0,733	-0,472	22,929	22,935
134	2,68	0,751	-0,203	23,049	23,051
135	2,70	0,791	-0,348	24,027	24,031
136	2,72	0,788	-0,231	22,641	22,643
137	2,74	0,801	-0,243	23,178	23,180
138	2,76	0,768	-0,266	23,869	23,871
139	2,78	0,630	-0,239	22,629	22,631
140	2,80	0,597	-0,347	23,608	23,611
141	2,82	0,577	-0,200	23,725	23,726
142	2,84	0,619	-0,221	22,965	22,967
143	2,86	0,583	-0,179	23,827	23,828
144	2,88	0,640	-0,174	24,046	24,047
145	2,90	0,592	-0,311	23,424	23,427
146	2,92	0,667	-0,231	24,408	24,410
147	2,94	0,623	-0,297	24,070	24,073
148	2,96	0,649	-0,340	23,413	23,417
149	2,98	0,522	-0,372	24,484	24,487
150	3,00	0,597	-0,368	23,994	23,998

151	3,02	0,574	-0,377	23,703	23,707
152	3,04	0,591	-0,426	24,844	24,849
153	3,06	0,636	-0,391	23,936	23,940
154	3,08	0,654	-0,508	23,903	23,910
155	3,10	0,664	-0,433	24,683	24,688
156	3,12	0,531	-0,618	24,205	24,214
157	3,14	0,550	-0,688	24,092	24,103
158	3,16	0,586	-0,673	25,087	25,098
159	3,18	0,481	-1,026	24,190	24,213
160	3,20	0,519	-0,634	24,476	24,486
161	3,22	0,552	-0,720	24,998	25,011
162	3,24	0,484	-0,826	24,105	24,121
163	3,26	0,498	-0,714	24,841	24,853
164	3,28	0,508	-0,778	24,998	25,012
165	3,30	0,437	-0,821	24,283	24,300
166	3,32	0,464	-0,729	24,937	24,950
167	3,34	0,484	-0,614	24,955	24,965
168	3,36	0,425	-0,625	24,301	24,312
169	3,38	0,369	-0,710	25,080	25,093
170	3,40	0,374	-0,608	25,246	25,257
171	3,42	0,361	-0,674	24,441	24,454
172	3,44	0,328	-0,471	25,239	25,247
173	3,46	0,312	-0,583	24,868	24,878
174	3,48	0,304	-0,371	24,370	24,376
175	3,50	0,312	-0,412	24,966	24,973
176	3,52	0,308	-0,342	24,792	24,798
177	3,54	0,334	-0,338	24,282	24,288
178	3,56	0,321	-0,137	24,869	24,873
179	3,58	0,331	-0,386	24,227	24,234
180	3,60	0,322	-0,187	24,023	24,027
181	3,62	0,331	-0,168	24,613	24,617
182	3,64	0,327	0,135	24,041	24,045
183	3,66	0,327	-0,183	24,020	24,024
184	3,68	0,332	-0,266	24,366	24,372
185	3,70	0,309	-0,174	23,714	23,718
186	3,72	0,308	-0,160	23,662	23,666
187	3,74	0,307	-0,243	23,943	23,948
188	3,76	0,309	-0,145	23,493	23,496
189	3,78	0,319	-0,020	23,510	23,513
190	3,80	0,316	-0,160	23,759	23,764
191	3,82	0,304	-0,148	23,051	23,055
192	3,84	0,278	-0,165	23,307	23,310
193	3,86	0,260	-0,155	23,343	23,346
194	3,88	0,267	-0,238	22,972	22,976
195	3,90	0,232	-0,287	23,407	23,411
196	3,92	0,257	-0,153	23,203	23,205
197	3,94	0,254	-0,351	22,741	22,746
198	3,96	0,264	-0,275	23,235	23,239
199	3,98	0,263	-0,239	22,889	22,893
200	4,00	0,271	-0,244	22,736	22,740

201	4,02	0,254	-0,236	23,192	23,195
202	4,04	0,256	-0,314	23,000	23,004
203	4,06	0,246	-0,309	22,765	22,770
204	4,08	0,254	-0,289	23,003	23,007
205	4,10	0,248	-0,284	22,755	22,759
206	4,12	0,262	-0,401	23,000	23,006
207	4,14	0,261	-0,376	23,338	23,343
208	4,16	0,261	-0,340	23,003	23,008
209	4,18	0,258	-0,447	23,098	23,105
210	4,20	0,248	-0,299	23,210	23,214
211	4,22	0,252	-0,283	23,039	23,043
212	4,24	0,242	-0,414	23,132	23,138
213	4,26	0,234	-0,287	23,428	23,432
214	4,28	0,242	-0,276	23,096	23,100
215	4,30	0,249	-0,386	23,284	23,290
216	4,32	0,251	-0,477	23,136	23,143
217	4,34	0,260	-0,517	22,970	22,978
218	4,36	0,245	-0,534	23,440	23,448
219	4,38	0,256	-0,560	23,442	23,451
220	4,40	0,269	-0,768	23,381	23,396
221	4,42	0,281	-0,845	23,638	23,656
222	4,44	0,293	-0,812	23,559	23,576
223	4,46	0,288	-0,933	23,713	23,735
224	4,48	0,275	-0,888	24,027	24,046
225	4,50	0,262	-0,871	23,797	23,815
226	4,52	0,262	-0,801	23,704	23,720
227	4,54	0,253	-0,798	24,172	24,187
228	4,56	0,279	-0,806	24,138	24,155
229	4,58	0,258	-0,816	24,290	24,306
230	4,60	0,288	-0,846	24,326	24,343
231	4,62	0,288	-0,864	24,139	24,157
232	4,64	0,293	-0,769	23,816	23,831
233	4,66	0,313	-0,737	24,014	24,029
234	4,68	0,293	-0,539	23,884	23,893
235	4,70	0,305	-0,567	23,778	23,788
236	4,72	0,287	-0,529	24,038	24,046
237	4,74	0,290	-0,498	23,868	23,876
238	4,76	0,268	-0,376	23,972	23,978
239	4,78	0,283	-0,456	24,141	24,148
240	4,80	0,276	-0,318	23,968	23,972
241	4,82	0,297	-0,353	24,212	24,218
242	4,84	0,273	-0,258	24,281	24,285
243	4,86	0,302	-0,373	23,886	23,892
244	4,88	0,294	-0,256	23,964	23,968
245	4,90	0,301	-0,266	23,793	23,798
246	4,92	0,279	-0,232	23,703	23,706
247	4,94	0,290	-0,122	23,724	23,727
248	4,96	0,317	-0,109	23,633	23,637
249	4,98	0,298	-0,080	23,210	23,213
250	5,00	0,294	-0,092	23,534	23,537

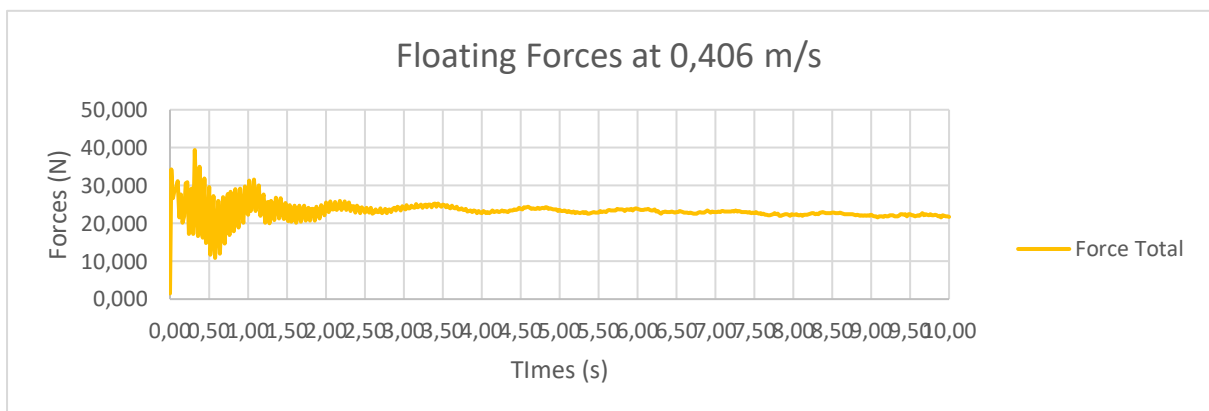
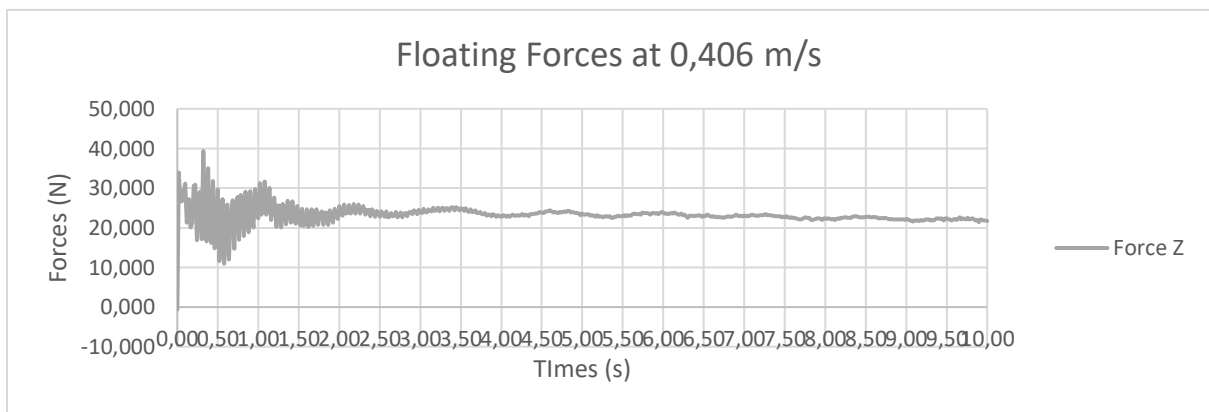
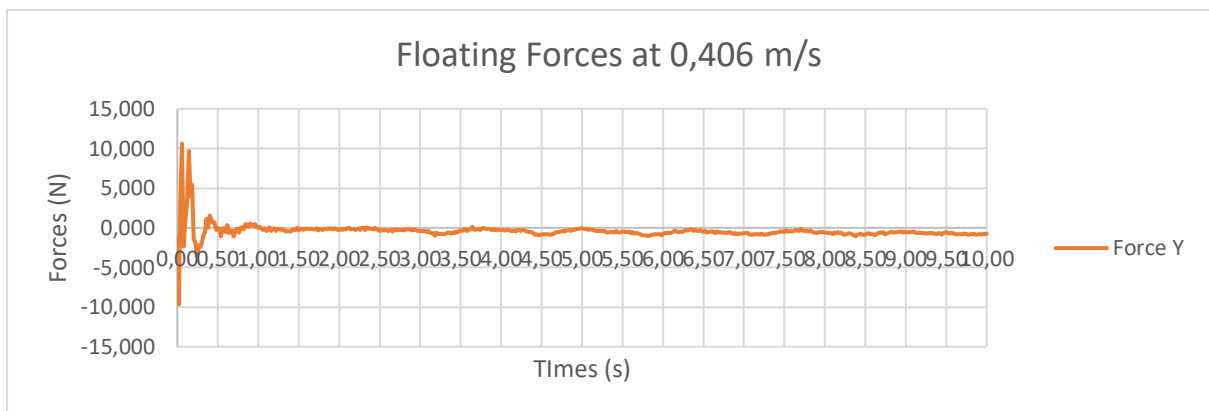
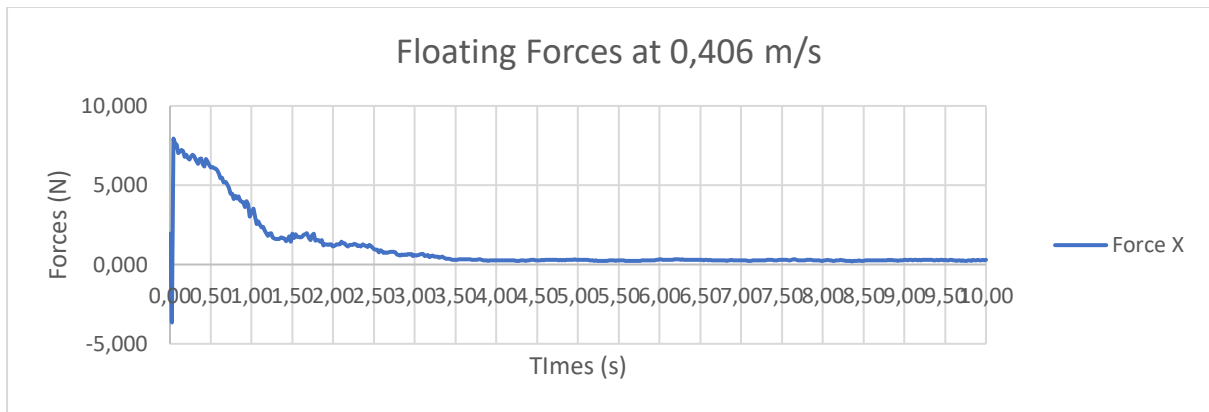
251	5,02	0,282	-0,134	23,327	23,330
252	5,04	0,290	-0,133	23,306	23,309
253	5,06	0,283	-0,161	23,415	23,419
254	5,08	0,308	-0,273	23,328	23,333
255	5,10	0,302	-0,222	23,043	23,047
256	5,12	0,289	-0,219	23,230	23,234
257	5,14	0,276	-0,362	23,002	23,007
258	5,16	0,265	-0,323	22,809	22,814
259	5,18	0,268	-0,379	23,111	23,117
260	5,20	0,240	-0,405	22,729	22,735
261	5,22	0,250	-0,433	22,936	22,943
262	5,24	0,234	-0,387	22,825	22,831
263	5,26	0,238	-0,422	22,703	22,709
264	5,28	0,223	-0,403	22,842	22,848
265	5,30	0,237	-0,542	22,956	22,965
266	5,32	0,239	-0,601	22,726	22,736
267	5,34	0,243	-0,528	22,921	22,930
268	5,36	0,233	-0,557	22,511	22,520
269	5,38	0,246	-0,545	22,485	22,494
270	5,40	0,259	-0,617	22,732	22,742
271	5,42	0,248	-0,425	22,765	22,771
272	5,44	0,264	-0,506	22,985	22,993
273	5,46	0,240	-0,573	22,847	22,856
274	5,48	0,264	-0,530	22,903	22,911
275	5,50	0,268	-0,475	22,903	22,910
276	5,52	0,262	-0,475	23,222	23,230
277	5,54	0,263	-0,504	22,960	22,968
278	5,56	0,262	-0,546	23,121	23,130
279	5,58	0,237	-0,486	23,083	23,090
280	5,60	0,244	-0,652	23,010	23,021
281	5,62	0,228	-0,550	23,450	23,459
282	5,64	0,242	-0,760	23,538	23,553
283	5,66	0,229	-0,696	23,423	23,436
284	5,68	0,236	-0,687	23,418	23,430
285	5,70	0,219	-0,744	23,391	23,404
286	5,72	0,227	-0,801	23,335	23,351
287	5,74	0,239	-0,914	23,798	23,818
288	5,76	0,242	-0,952	23,720	23,741
289	5,78	0,251	-0,952	23,735	23,756
290	5,80	0,247	-0,981	23,674	23,697
291	5,82	0,276	-0,980	23,546	23,569
292	5,84	0,273	-0,982	23,278	23,302
293	5,86	0,274	-0,856	23,666	23,684
294	5,88	0,258	-0,840	23,719	23,736
295	5,90	0,248	-0,774	23,512	23,527
296	5,92	0,267	-0,818	23,779	23,796
297	5,94	0,272	-0,828	23,452	23,469
298	5,96	0,280	-0,811	23,769	23,786
299	5,98	0,301	-0,917	23,985	24,005
300	6,00	0,323	-0,726	23,836	23,851

301	6,02	0,322	-0,692	23,606	23,619
302	6,04	0,304	-0,675	23,579	23,592
303	6,06	0,302	-0,617	23,507	23,518
304	6,08	0,292	-0,644	23,543	23,555
305	6,10	0,285	-0,582	23,649	23,659
306	6,12	0,297	-0,530	23,612	23,621
307	6,14	0,289	-0,400	23,792	23,798
308	6,16	0,302	-0,423	23,530	23,537
309	6,18	0,321	-0,518	23,326	23,336
310	6,20	0,320	-0,566	23,331	23,342
311	6,22	0,321	-0,469	23,618	23,627
312	6,24	0,332	-0,524	23,146	23,156
313	6,26	0,311	-0,394	23,250	23,257
314	6,28	0,321	-0,295	22,892	22,898
315	6,30	0,297	-0,358	22,522	22,528
316	6,32	0,291	-0,261	23,004	23,009
317	6,34	0,296	-0,196	23,011	23,015
318	6,36	0,291	-0,201	23,089	23,093
319	6,38	0,291	-0,389	22,931	22,938
320	6,40	0,297	-0,297	23,018	23,023
321	6,42	0,288	-0,366	22,985	22,991
322	6,44	0,294	-0,408	23,150	23,156
323	6,46	0,295	-0,254	22,998	23,003
324	6,48	0,300	-0,436	22,832	22,839
325	6,50	0,287	-0,440	22,991	22,998
326	6,52	0,302	-0,399	22,969	22,976
327	6,54	0,275	-0,629	23,256	23,267
328	6,56	0,282	-0,513	23,176	23,184
329	6,58	0,288	-0,451	22,956	22,964
330	6,60	0,276	-0,442	22,804	22,811
331	6,62	0,280	-0,441	22,869	22,876
332	6,64	0,258	-0,681	22,761	22,773
333	6,66	0,277	-0,471	22,693	22,701
334	6,68	0,278	-0,588	22,809	22,819
335	6,70	0,265	-0,509	22,700	22,708
336	6,72	0,267	-0,612	22,594	22,604
337	6,74	0,268	-0,629	22,487	22,499
338	6,76	0,254	-0,635	22,592	22,603
339	6,78	0,248	-0,642	22,782	22,793
340	6,80	0,263	-0,598	22,958	22,968
341	6,82	0,241	-0,555	22,837	22,846
342	6,84	0,270	-0,702	22,831	22,845
343	6,86	0,265	-0,660	22,894	22,906
344	6,88	0,285	-0,788	23,069	23,085
345	6,90	0,261	-0,696	23,340	23,352
346	6,92	0,262	-0,785	23,091	23,106
347	6,94	0,255	-0,712	22,869	22,882
348	6,96	0,273	-0,710	23,059	23,073
349	6,98	0,249	-0,738	22,919	22,933
350	7,00	0,265	-0,668	22,979	22,991

351	7,02	0,275	-0,698	22,929	22,942
352	7,04	0,252	-0,598	23,090	23,100
353	7,06	0,259	-0,829	22,939	22,956
354	7,08	0,241	-0,857	23,239	23,257
355	7,10	0,244	-0,863	23,257	23,275
356	7,12	0,233	-0,799	23,148	23,163
357	7,14	0,251	-0,805	23,095	23,111
358	7,16	0,255	-0,801	23,052	23,068
359	7,18	0,274	-0,773	23,065	23,081
360	7,20	0,266	-0,867	23,119	23,137
361	7,22	0,264	-0,766	23,186	23,201
362	7,24	0,257	-0,891	23,144	23,164
363	7,26	0,250	-0,888	23,402	23,421
364	7,28	0,257	-0,831	23,159	23,176
365	7,30	0,263	-0,863	23,185	23,204
366	7,32	0,295	-0,752	23,141	23,157
367	7,34	0,311	-0,664	23,030	23,043
368	7,36	0,310	-0,632	22,976	22,988
369	7,38	0,296	-0,671	22,965	22,978
370	7,40	0,261	-0,631	22,910	22,921
371	7,42	0,254	-0,605	22,847	22,857
372	7,44	0,256	-0,443	22,919	22,926
373	7,46	0,283	-0,478	22,677	22,685
374	7,48	0,290	-0,477	22,837	22,845
375	7,50	0,311	-0,529	22,693	22,702
376	7,52	0,302	-0,312	22,961	22,967
377	7,54	0,298	-0,450	22,674	22,682
378	7,56	0,289	-0,453	22,545	22,553
379	7,58	0,257	-0,398	22,670	22,676
380	7,60	0,276	-0,459	22,451	22,459
381	7,62	0,285	-0,433	22,504	22,511
382	7,64	0,319	-0,284	22,339	22,344
383	7,66	0,317	-0,318	22,263	22,269
384	7,68	0,297	-0,376	22,067	22,073
385	7,70	0,274	-0,139	22,130	22,134
386	7,72	0,257	-0,329	22,235	22,240
387	7,74	0,264	-0,371	22,478	22,484
388	7,76	0,272	-0,355	22,647	22,653
389	7,78	0,276	-0,387	22,477	22,483
390	7,80	0,300	-0,476	22,552	22,560
391	7,82	0,308	-0,351	21,927	21,934
392	7,84	0,308	-0,477	22,012	22,021
393	7,86	0,290	-0,602	22,069	22,080
394	7,88	0,275	-0,622	22,197	22,208
395	7,90	0,252	-0,658	22,414	22,426
396	7,92	0,262	-0,558	22,363	22,372
397	7,94	0,258	-0,547	22,270	22,279
398	7,96	0,247	-0,523	22,025	22,033
399	7,98	0,235	-0,529	22,349	22,357
400	8,00	0,245	-0,594	22,333	22,343

401	8,02	0,254	-0,586	22,298	22,308
402	8,04	0,273	-0,692	22,377	22,390
403	8,06	0,285	-0,644	22,181	22,193
404	8,08	0,272	-0,676	22,072	22,085
405	8,10	0,259	-0,774	22,225	22,241
406	8,12	0,244	-0,625	22,030	22,041
407	8,14	0,232	-0,656	22,296	22,308
408	8,16	0,250	-0,570	22,328	22,338
409	8,18	0,264	-0,687	22,223	22,236
410	8,20	0,261	-0,602	22,447	22,458
411	8,22	0,285	-0,777	22,547	22,563
412	8,24	0,269	-0,853	22,662	22,681
413	8,26	0,254	-0,802	22,639	22,656
414	8,28	0,228	-0,763	22,464	22,479
415	8,30	0,240	-0,703	22,517	22,530
416	8,32	0,218	-0,743	22,448	22,462
417	8,34	0,231	-0,895	22,795	22,815
418	8,36	0,208	-0,911	22,853	22,872
419	8,38	0,235	-1,090	22,909	22,937
420	8,40	0,241	-0,887	22,785	22,804
421	8,42	0,239	-0,786	22,681	22,696
422	8,44	0,247	-0,741	22,620	22,634
423	8,46	0,225	-0,852	22,658	22,676
424	8,48	0,232	-0,853	22,690	22,708
425	8,50	0,228	-0,863	22,793	22,812
426	8,52	0,248	-0,752	22,786	22,800
427	8,54	0,257	-0,657	22,722	22,734
428	8,56	0,270	-0,797	22,616	22,632
429	8,58	0,274	-0,816	22,669	22,686
430	8,60	0,278	-0,792	22,774	22,791
431	8,62	0,279	-0,966	22,687	22,710
432	8,64	0,267	-0,830	22,570	22,587
433	8,66	0,263	-0,664	22,423	22,435
434	8,68	0,257	-0,628	22,409	22,420
435	8,70	0,269	-0,578	22,467	22,477
436	8,72	0,255	-0,537	22,408	22,417
437	8,74	0,270	-0,813	22,471	22,489
438	8,76	0,262	-0,735	22,408	22,423
439	8,78	0,276	-0,697	22,293	22,307
440	8,80	0,290	-0,574	22,143	22,153
441	8,82	0,275	-0,474	22,219	22,227
442	8,84	0,283	-0,576	22,064	22,074
443	8,86	0,271	-0,592	22,050	22,061
444	8,88	0,254	-0,534	22,107	22,116
445	8,90	0,253	-0,525	22,056	22,065
446	8,92	0,240	-0,493	22,070	22,077
447	8,94	0,254	-0,483	22,050	22,058
448	8,96	0,267	-0,575	22,094	22,104
449	8,98	0,278	-0,499	21,963	21,971
450	9,00	0,288	-0,548	22,238	22,248

451	9,02	0,295	-0,615	22,041	22,053
452	9,04	0,278	-0,545	21,816	21,825
453	9,06	0,281	-0,535	21,790	21,799
454	9,08	0,286	-0,525	21,617	21,627
455	9,10	0,276	-0,475	21,829	21,837
456	9,12	0,289	-0,600	21,781	21,792
457	9,14	0,300	-0,642	21,824	21,836
458	9,16	0,275	-0,650	21,699	21,712
459	9,18	0,294	-0,619	21,961	21,973
460	9,20	0,273	-0,668	21,878	21,891
461	9,22	0,290	-0,641	21,819	21,832
462	9,24	0,280	-0,657	22,119	22,132
463	9,26	0,295	-0,758	22,104	22,121
464	9,28	0,299	-0,678	22,136	22,150
465	9,30	0,287	-0,660	21,875	21,888
466	9,32	0,293	-0,614	21,902	21,914
467	9,34	0,302	-0,733	21,862	21,877
468	9,36	0,271	-0,747	22,135	22,150
469	9,38	0,270	-0,772	22,356	22,372
470	9,40	0,293	-0,647	22,421	22,433
471	9,42	0,258	-0,667	22,299	22,312
472	9,44	0,292	-0,848	22,415	22,434
473	9,46	0,296	-0,670	21,869	21,883
474	9,48	0,258	-0,624	22,409	22,420
475	9,50	0,285	-0,530	22,407	22,416
476	9,52	0,272	-0,703	22,088	22,102
477	9,54	0,258	-0,734	22,063	22,078
478	9,56	0,295	-0,626	21,795	21,807
479	9,58	0,284	-0,669	22,038	22,051
480	9,60	0,256	-0,711	22,172	22,186
481	9,62	0,267	-0,810	22,002	22,020
482	9,64	0,244	-0,806	22,194	22,211
483	9,66	0,257	-0,838	22,643	22,661
484	9,68	0,276	-0,825	22,089	22,108
485	9,70	0,244	-0,784	22,378	22,394
486	9,72	0,248	-0,724	22,232	22,246
487	9,74	0,245	-0,757	22,067	22,082
488	9,76	0,237	-0,893	22,469	22,489
489	9,78	0,270	-0,900	22,097	22,118
490	9,80	0,272	-0,802	22,176	22,193
491	9,82	0,238	-0,775	22,315	22,330
492	9,84	0,283	-0,764	22,139	22,155
493	9,86	0,260	-0,904	21,896	21,918
494	9,88	0,279	-0,850	22,009	22,028
495	9,90	0,296	-0,819	21,488	21,507
496	9,92	0,268	-0,821	22,115	22,133
497	9,94	0,261	-0,777	22,028	22,044
498	9,96	0,288	-0,737	21,792	21,808
499	9,98	0,265	-0,782	21,807	21,823
500	10,00	0,283	-0,726	21,689	21,705



Berdasarkan grafik diatas, nilai tahanan model kapal menggunakan *bulbous bow* terjadi pada waktu 9,0 – 9,5 s. Sehingga apabila dirata – rata nilai tahanan model kapal 0,569 N.

- Kecepatan 0,488 m/s

Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	1,935	-2,241	-0,633	1,499
1	0,02	6,225	-17,241	33,411	33,812
2	0,04	5,162	6,117	26,580	26,648
3	0,06	5,814	17,606	26,748	28,772
4	0,08	5,744	-2,381	21,181	21,193
5	0,10	6,455	1,048	22,720	22,723
6	0,12	6,906	4,695	21,088	21,286
7	0,14	6,636	15,105	26,543	26,928
8	0,16	6,930	5,894	37,399	37,569
9	0,18	6,394	8,819	18,928	19,662
10	0,20	6,024	-2,009	43,945	43,965
11	0,22	6,196	-3,900	28,382	28,480
12	0,24	5,865	-4,649	14,175	14,452
13	0,26	5,479	-2,930	38,694	38,735
14	0,28	5,740	-4,046	26,244	26,360
15	0,30	5,677	-1,646	15,791	15,828
16	0,32	5,555	-2,963	37,038	37,089
17	0,34	5,509	0,981	20,826	20,843
18	0,36	5,600	2,004	15,888	15,936
19	0,38	5,318	-0,211	34,558	34,564
20	0,40	5,275	2,111	18,318	18,365
21	0,42	5,423	1,958	17,424	17,468
22	0,44	5,133	1,119	32,877	32,885
23	0,46	5,054	1,091	17,701	17,715
24	0,48	5,017	-1,122	19,743	19,755
25	0,50	4,895	0,244	33,549	33,551
26	0,52	4,673	-0,796	15,390	15,398
27	0,54	4,539	-2,435	22,362	22,411
28	0,56	4,309	-0,261	32,836	32,837
29	0,58	4,226	-0,690	16,322	16,329
30	0,60	4,172	-0,572	22,986	22,990
31	0,62	4,159	0,048	30,911	30,911
32	0,64	4,228	-0,695	17,144	17,151
33	0,66	4,104	0,027	24,548	24,549
34	0,68	3,904	-0,144	28,901	28,901
35	0,70	3,703	-0,566	16,896	16,900
36	0,72	3,388	-0,140	27,022	27,024
37	0,74	3,318	-0,485	26,596	26,599
38	0,76	2,873	-0,857	16,849	16,860
39	0,78	2,768	0,506	28,458	28,460
40	0,80	2,873	-0,910	26,287	26,294
41	0,82	2,103	-1,565	16,910	16,942
42	0,84	2,644	0,379	28,702	28,704
43	0,86	2,962	-0,062	24,963	24,963
44	0,88	2,502	-1,155	19,148	19,162
45	0,90	2,545	-0,446	28,858	28,860
46	0,92	2,629	0,163	23,374	23,376
47	0,94	1,968	-0,740	20,875	20,881
48	0,96	1,792	-0,278	29,063	29,064
49	0,98	1,882	-0,208	22,535	22,537
50	1,00	1,565	-0,199	21,396	21,397

51	1,02	1,642	-0,484	29,714	29,717
52	1,04	1,535	-0,766	21,082	21,088
53	1,06	1,590	0,119	23,149	23,150
54	1,08	1,988	0,105	28,686	28,687
55	1,10	1,924	-0,963	20,768	20,778
56	1,12	1,415	-0,537	24,384	24,387
57	1,14	1,760	0,427	27,951	27,954
58	1,16	1,795	-0,844	20,708	20,716
59	1,18	1,671	-0,773	25,012	25,017
60	1,20	1,856	-0,037	27,206	27,208
61	1,22	1,395	-0,763	20,448	20,455
62	1,24	1,826	-0,645	25,970	25,975
63	1,26	1,014	-0,654	25,925	25,929
64	1,28	1,517	-0,646	20,914	20,920
65	1,30	1,383	-0,766	26,437	26,442
66	1,32	1,454	-0,925	25,264	25,271
67	1,34	1,317	-0,632	21,067	21,072
68	1,36	1,346	-0,749	26,697	26,702
69	1,38	1,446	-0,764	24,312	24,318
70	1,40	1,327	-0,858	21,987	21,995
71	1,42	1,276	-0,407	26,750	26,753
72	1,44	0,953	-0,777	23,257	23,263
73	1,46	1,080	-0,904	22,539	22,547
74	1,48	0,914	-0,379	26,745	26,747
75	1,50	1,066	-0,717	23,125	23,131
76	1,52	0,945	-0,693	22,618	22,624
77	1,54	0,771	-0,538	26,397	26,400
78	1,56	0,915	-0,434	22,530	22,533
79	1,58	0,773	-0,506	23,102	23,106
80	1,60	0,869	-0,517	26,220	26,223
81	1,62	0,689	-0,547	22,068	22,072
82	1,64	0,806	-0,292	23,329	23,331
83	1,66	0,844	-0,176	25,629	25,631
84	1,68	0,778	-0,554	22,050	22,054
85	1,70	0,860	0,080	23,850	23,852
86	1,72	0,709	-0,194	24,988	24,989
87	1,74	0,762	-0,215	21,811	21,813
88	1,76	0,684	-0,101	24,304	24,305
89	1,78	0,933	-0,125	24,989	24,991
90	1,80	0,675	-0,441	21,421	21,424
91	1,82	0,711	-0,061	24,399	24,400
92	1,84	0,795	0,231	24,360	24,362
93	1,86	0,779	-0,342	21,716	21,718
94	1,88	0,904	0,025	25,128	25,130
95	1,90	0,537	-0,231	23,633	23,634
96	1,92	0,766	-0,431	22,389	22,393
97	1,94	0,690	0,271	25,189	25,191
98	1,96	0,688	0,018	23,471	23,472
99	1,98	0,496	0,013	22,405	22,406
100	2,00	0,350	-0,073	24,936	24,936

101	2,02	0,427	-0,100	23,346	23,348
102	2,04	0,412	-0,412	22,670	22,673
103	2,06	0,453	-0,062	25,424	25,426
104	2,08	0,310	-0,414	22,806	22,809
105	2,10	0,431	-0,310	23,180	23,183
106	2,12	0,336	-0,126	25,101	25,102
107	2,14	0,353	-0,459	22,662	22,665
108	2,16	0,346	-0,338	23,563	23,565
109	2,18	0,251	0,019	24,702	24,703
110	2,20	0,326	-0,856	23,393	23,401
111	2,22	0,266	-0,191	23,812	23,813
112	2,24	0,379	-0,528	25,041	25,045
113	2,26	0,251	-0,837	22,614	22,621
114	2,28	0,291	-0,283	23,971	23,974
115	2,30	0,258	-0,624	24,929	24,933
116	2,32	0,279	-0,623	23,066	23,071
117	2,34	0,281	-0,603	24,684	24,688
118	2,36	0,209	-0,610	24,361	24,365
119	2,38	0,314	-0,777	22,838	22,845
120	2,40	0,275	-0,353	24,280	24,283
121	2,42	0,342	-0,923	24,364	24,373
122	2,44	0,252	-0,941	23,183	23,192
123	2,46	0,304	-0,570	24,689	24,693
124	2,48	0,300	-0,365	23,910	23,913
125	2,50	0,311	-0,786	23,178	23,185
126	2,52	0,326	-0,561	24,658	24,663
127	2,54	0,265	-1,230	23,485	23,499
128	2,56	0,319	-0,552	23,445	23,450
129	2,58	0,308	-0,948	25,040	25,048
130	2,60	0,344	-0,843	23,607	23,615
131	2,62	0,293	-0,871	23,651	23,659
132	2,64	0,307	-0,568	24,587	24,592
133	2,66	0,321	-0,775	23,284	23,291
134	2,68	0,332	-0,933	23,885	23,894
135	2,70	0,344	-0,727	24,699	24,706
136	2,72	0,259	-0,834	23,322	23,329
137	2,74	0,311	-0,539	23,974	23,978
138	2,76	0,280	-0,755	24,665	24,671
139	2,78	0,338	-0,624	23,224	23,230
140	2,80	0,296	-0,568	24,167	24,171
141	2,82	0,272	-0,526	24,222	24,226
142	2,84	0,327	-0,457	23,607	23,611
143	2,86	0,290	-0,230	24,162	24,165
144	2,88	0,331	-0,581	24,296	24,301
145	2,90	0,266	-0,909	23,531	23,539
146	2,92	0,335	-0,590	24,493	24,498
147	2,94	0,302	-0,488	24,294	24,298
148	2,96	0,321	-0,636	23,551	23,556
149	2,98	0,273	-0,696	24,540	24,546
150	3,00	0,293	-0,506	24,140	24,143

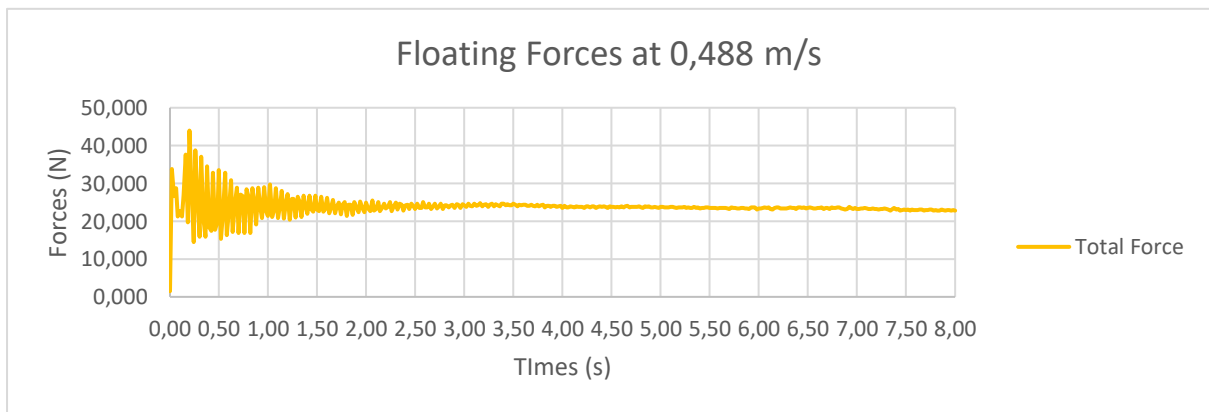
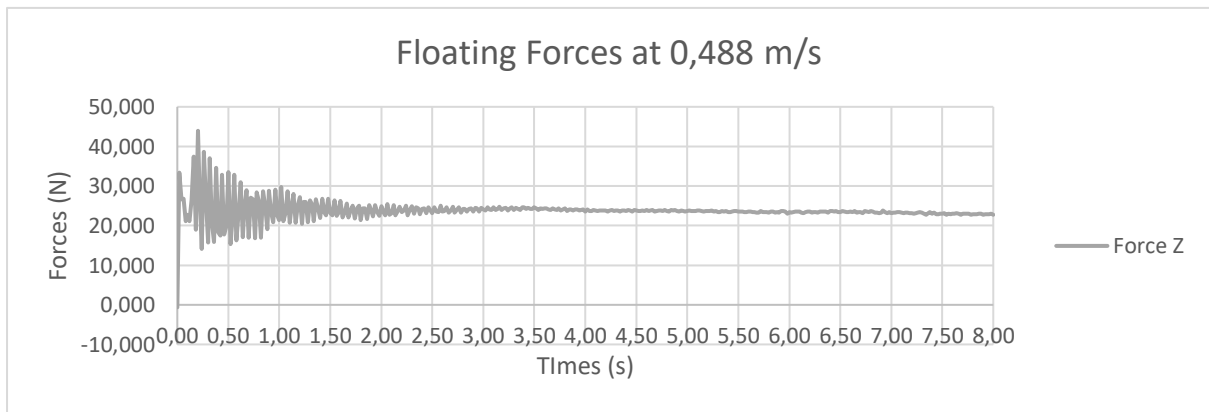
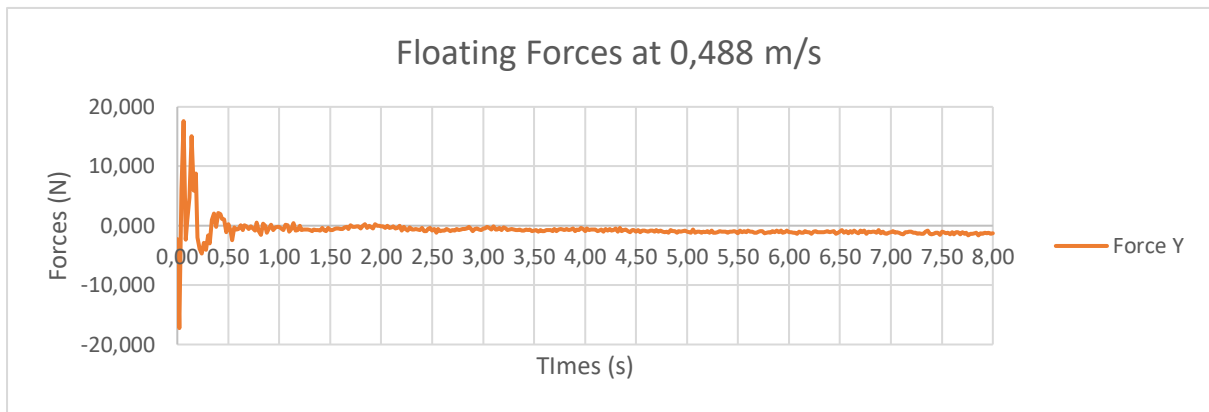
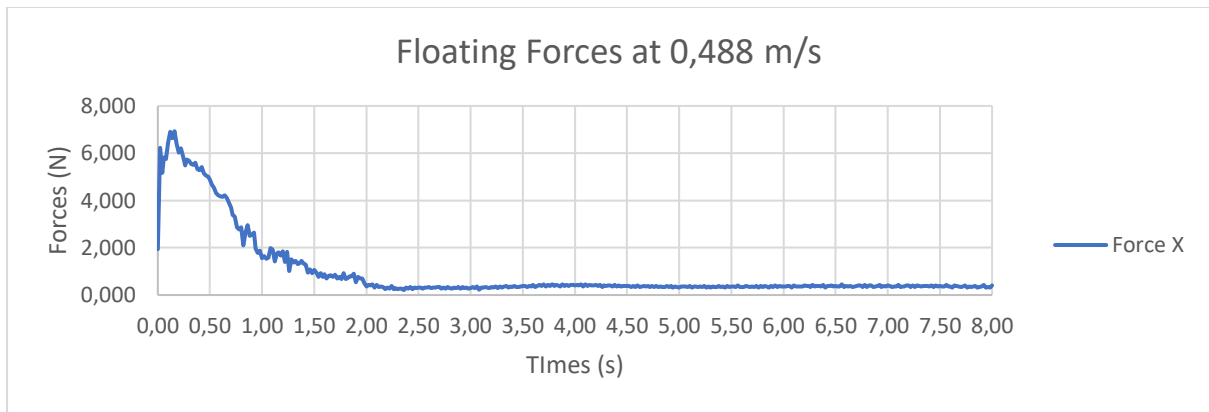
151	3,02	0,333	-0,463	23,820	23,825
152	3,04	0,285	-0,187	24,693	24,695
153	3,06	0,364	-0,366	24,122	24,126
154	3,08	0,230	-0,668	23,961	23,966
155	3,10	0,319	-0,112	24,576	24,578
156	3,12	0,312	-0,604	24,016	24,021
157	3,14	0,329	-0,683	24,184	24,190
158	3,16	0,321	-0,363	24,744	24,747
159	3,18	0,291	-0,747	23,905	23,912
160	3,20	0,338	-0,322	24,376	24,379
161	3,22	0,307	-0,501	24,541	24,545
162	3,24	0,366	-0,723	23,845	23,852
163	3,26	0,303	-0,685	24,361	24,367
164	3,28	0,371	-0,579	24,601	24,606
165	3,30	0,314	-0,683	23,953	23,959
166	3,32	0,361	-0,760	24,427	24,434
167	3,34	0,375	-0,728	24,196	24,203
168	3,36	0,306	-0,657	23,906	23,912
169	3,38	0,370	-0,821	24,595	24,603
170	3,40	0,341	-0,791	24,586	24,594
171	3,42	0,391	-0,648	24,223	24,230
172	3,44	0,337	-0,777	24,437	24,444
173	3,46	0,347	-0,646	24,211	24,217
174	3,48	0,361	-0,941	24,182	24,192
175	3,50	0,377	-0,870	24,661	24,669
176	3,52	0,376	-0,694	24,381	24,388
177	3,54	0,332	-0,980	23,984	23,994
178	3,56	0,381	-0,721	24,369	24,376
179	3,58	0,358	-0,932	24,206	24,216
180	3,60	0,427	-0,884	24,301	24,311
181	3,62	0,336	-0,704	24,386	24,393
182	3,64	0,388	-0,698	24,111	24,118
183	3,66	0,430	-0,766	24,009	24,018
184	3,68	0,390	-0,897	24,322	24,332
185	3,70	0,443	-0,595	24,126	24,134
186	3,72	0,355	-0,886	23,973	23,982
187	3,74	0,434	-0,613	24,359	24,366
188	3,76	0,389	-0,561	23,871	23,877
189	3,78	0,443	-0,604	24,152	24,159
190	3,80	0,380	-0,696	24,345	24,352
191	3,82	0,430	-0,552	23,649	23,656
192	3,84	0,412	-0,781	24,069	24,078
193	3,86	0,371	-0,615	24,089	24,096
194	3,88	0,450	-0,507	23,813	23,819
195	3,90	0,388	-0,948	24,104	24,115
196	3,92	0,438	-0,688	24,121	24,129
197	3,94	0,387	-0,759	23,798	23,806
198	3,96	0,435	-0,393	23,957	23,963
199	3,98	0,419	-0,539	24,035	24,041
200	4,00	0,416	-0,879	23,493	23,504

201	4,02	0,421	-0,475	24,119	24,125
202	4,04	0,411	-0,777	23,684	23,693
203	4,06	0,447	-0,644	23,681	23,689
204	4,08	0,360	-0,680	23,958	23,964
205	4,10	0,455	-0,641	23,776	23,784
206	4,12	0,386	-0,898	23,694	23,704
207	4,14	0,432	-0,788	23,882	23,891
208	4,16	0,404	-0,633	23,817	23,824
209	4,18	0,397	-0,984	23,781	23,793
210	4,20	0,418	-0,588	23,809	23,816
211	4,22	0,372	-0,793	23,565	23,573
212	4,24	0,432	-0,524	23,875	23,882
213	4,26	0,349	-0,803	23,888	23,896
214	4,28	0,416	-0,774	23,635	23,644
215	4,30	0,391	-0,492	23,871	23,877
216	4,32	0,397	-1,001	23,855	23,866
217	4,34	0,395	-0,405	23,553	23,558
218	4,36	0,357	-0,903	23,796	23,806
219	4,38	0,420	-0,778	23,879	23,887
220	4,40	0,355	-0,611	23,716	23,721
221	4,42	0,398	-0,915	23,924	23,934
222	4,44	0,356	-1,082	23,786	23,798
223	4,46	0,381	-0,715	23,514	23,521
224	4,48	0,380	-0,759	23,900	23,908
225	4,50	0,372	-0,969	23,825	23,836
226	4,52	0,387	-0,774	23,732	23,740
227	4,54	0,345	-1,095	23,697	23,708
228	4,56	0,392	-0,815	23,755	23,764
229	4,58	0,331	-0,872	23,643	23,652
230	4,60	0,397	-0,955	23,909	23,920
231	4,62	0,343	-1,022	23,691	23,701
232	4,64	0,366	-0,789	23,859	23,867
233	4,66	0,374	-0,814	24,004	24,012
234	4,68	0,353	-1,028	23,584	23,595
235	4,70	0,381	-0,713	23,723	23,730
236	4,72	0,327	-1,033	23,811	23,822
237	4,74	0,372	-0,846	23,839	23,848
238	4,76	0,335	-0,980	23,750	23,760
239	4,78	0,378	-1,060	23,895	23,907
240	4,80	0,347	-1,050	23,650	23,662
241	4,82	0,361	-1,143	23,555	23,568
242	4,84	0,348	-0,765	23,925	23,933
243	4,86	0,330	-0,876	23,826	23,834
244	4,88	0,392	-0,924	23,891	23,901
245	4,90	0,338	-1,154	23,649	23,662
246	4,92	0,374	-0,898	23,574	23,584
247	4,94	0,317	-1,011	23,792	23,802
248	4,96	0,351	-0,926	23,695	23,704
249	4,98	0,344	-0,829	23,548	23,557
250	5,00	0,324	-1,034	23,745	23,756

251	5,02	0,365	-1,056	23,779	23,790
252	5,04	0,356	-1,198	23,650	23,664
253	5,06	0,353	-0,687	23,683	23,689
254	5,08	0,339	-1,193	23,673	23,687
255	5,10	0,390	-0,999	23,765	23,777
256	5,12	0,312	-1,001	23,757	23,767
257	5,14	0,356	-1,153	23,702	23,716
258	5,16	0,349	-0,973	23,543	23,553
259	5,18	0,346	-1,052	23,693	23,704
260	5,20	0,362	-0,939	23,649	23,659
261	5,22	0,343	-1,145	23,616	23,629
262	5,24	0,392	-0,848	23,842	23,851
263	5,26	0,327	-1,155	23,492	23,505
264	5,28	0,367	-1,156	23,618	23,631
265	5,30	0,323	-1,087	23,447	23,459
266	5,32	0,351	-0,949	23,429	23,439
267	5,34	0,334	-0,963	23,735	23,744
268	5,36	0,327	-1,044	23,492	23,503
269	5,38	0,377	-0,965	23,662	23,672
270	5,40	0,338	-1,169	23,421	23,435
271	5,42	0,357	-0,984	23,456	23,466
272	5,44	0,314	-1,002	23,560	23,570
273	5,46	0,375	-0,938	23,683	23,693
274	5,48	0,343	-0,995	23,702	23,712
275	5,50	0,361	-1,312	23,520	23,536
276	5,52	0,351	-0,860	23,511	23,520
277	5,54	0,344	-1,097	23,523	23,535
278	5,56	0,407	-0,898	23,456	23,466
279	5,58	0,339	-1,086	23,421	23,433
280	5,60	0,340	-0,832	23,505	23,513
281	5,62	0,339	-1,030	23,567	23,578
282	5,64	0,393	-0,989	23,480	23,491
283	5,66	0,360	-1,163	23,477	23,491
284	5,68	0,332	-1,157	23,306	23,319
285	5,70	0,365	-1,033	23,215	23,226
286	5,72	0,347	-0,892	23,646	23,655
287	5,74	0,388	-0,889	23,436	23,446
288	5,76	0,325	-1,234	23,481	23,495
289	5,78	0,394	-1,184	23,361	23,376
290	5,80	0,335	-1,099	23,341	23,353
291	5,82	0,374	-1,227	23,528	23,543
292	5,84	0,364	-0,907	23,536	23,546
293	5,86	0,324	-1,120	23,337	23,350
294	5,88	0,373	-0,869	23,376	23,385
295	5,90	0,346	-1,098	23,248	23,260
296	5,92	0,401	-0,832	23,673	23,682
297	5,94	0,333	-1,146	23,699	23,711
298	5,96	0,392	-1,056	23,593	23,605
299	5,98	0,355	-0,841	23,061	23,070
300	6,00	0,350	-1,103	23,350	23,362

301	6,02	0,359	-1,090	23,313	23,325
302	6,04	0,372	-1,208	23,479	23,493
303	6,06	0,381	-1,165	23,575	23,589
304	6,08	0,318	-1,333	23,526	23,542
305	6,10	0,406	-0,996	23,616	23,628
306	6,12	0,351	-1,198	23,255	23,269
307	6,14	0,358	-1,209	23,122	23,136
308	6,16	0,355	-0,929	23,441	23,451
309	6,18	0,366	-1,113	23,593	23,605
310	6,20	0,397	-1,117	23,586	23,599
311	6,22	0,384	-1,404	23,326	23,345
312	6,24	0,383	-1,027	23,353	23,365
313	6,26	0,339	-0,888	23,429	23,438
314	6,28	0,424	-1,057	23,310	23,323
315	6,30	0,362	-1,133	23,534	23,547
316	6,32	0,380	-1,141	23,592	23,605
317	6,34	0,375	-1,087	23,551	23,563
318	6,36	0,363	-0,972	23,484	23,494
319	6,38	0,434	-0,945	23,243	23,255
320	6,40	0,326	-1,122	23,661	23,674
321	6,42	0,378	-0,996	23,654	23,665
322	6,44	0,384	-0,936	23,492	23,503
323	6,46	0,415	-1,357	23,651	23,670
324	6,48	0,357	-1,155	23,384	23,398
325	6,50	0,375	-0,965	23,442	23,452
326	6,52	0,357	-0,778	23,641	23,649
327	6,54	0,370	-1,229	23,551	23,566
328	6,56	0,458	-0,882	23,423	23,434
329	6,58	0,340	-1,239	23,386	23,400
330	6,60	0,380	-0,887	23,566	23,576
331	6,62	0,353	-1,201	23,431	23,445
332	6,64	0,382	-0,866	23,673	23,683
333	6,66	0,347	-1,059	23,258	23,270
334	6,68	0,350	-1,261	23,437	23,452
335	6,70	0,377	-0,863	23,447	23,456
336	6,72	0,396	-1,120	23,162	23,176
337	6,74	0,403	-0,821	23,648	23,658
338	6,76	0,330	-1,346	23,483	23,499
339	6,78	0,420	-1,032	23,470	23,482
340	6,80	0,336	-1,127	23,628	23,641
341	6,82	0,398	-0,996	23,574	23,586
342	6,84	0,409	-1,001	23,289	23,301
343	6,86	0,345	-1,222	23,215	23,230
344	6,88	0,361	-0,767	23,118	23,126
345	6,90	0,383	-1,268	23,220	23,236
346	6,92	0,427	-1,002	23,814	23,826
347	6,94	0,334	-1,259	23,466	23,481
348	6,96	0,383	-1,369	23,158	23,176
349	6,98	0,356	-1,226	23,469	23,484
350	7,00	0,396	-1,115	23,198	23,211

351	7,02	0,387	-0,949	23,266	23,277
352	7,04	0,347	-1,184	23,341	23,355
353	7,06	0,352	-1,059	23,377	23,388
354	7,08	0,365	-1,187	23,458	23,472
355	7,10	0,438	-1,322	23,289	23,307
356	7,12	0,348	-1,414	23,165	23,183
357	7,14	0,361	-1,098	23,237	23,250
358	7,16	0,361	-1,136	23,334	23,347
359	7,18	0,402	-1,027	23,158	23,171
360	7,20	0,417	-1,028	23,199	23,211
361	7,22	0,344	-1,228	23,036	23,051
362	7,24	0,401	-1,160	23,175	23,189
363	7,26	0,348	-1,330	23,239	23,256
364	7,28	0,417	-1,303	23,402	23,419
365	7,30	0,380	-1,347	23,223	23,241
366	7,32	0,350	-1,386	23,026	23,044
367	7,34	0,375	-0,985	22,767	22,778
368	7,36	0,388	-0,834	23,180	23,189
369	7,38	0,387	-1,353	23,442	23,459
370	7,40	0,350	-1,430	23,037	23,056
371	7,42	0,398	-1,389	23,225	23,243
372	7,44	0,336	-1,219	22,825	22,840
373	7,46	0,413	-1,187	22,899	22,914
374	7,48	0,349	-1,590	23,022	23,045
375	7,50	0,382	-0,976	22,973	22,984
376	7,52	0,366	-1,114	23,094	23,107
377	7,54	0,367	-1,295	22,752	22,769
378	7,56	0,419	-1,196	23,024	23,039
379	7,58	0,350	-1,461	22,901	22,921
380	7,60	0,369	-1,064	23,002	23,014
381	7,62	0,326	-1,448	22,977	22,996
382	7,64	0,399	-1,065	23,124	23,137
383	7,66	0,388	-1,137	23,049	23,063
384	7,68	0,365	-1,455	22,792	22,812
385	7,70	0,332	-1,133	22,989	23,002
386	7,72	0,368	-1,395	22,983	23,002
387	7,74	0,414	-1,204	23,063	23,078
388	7,76	0,321	-1,614	23,045	23,068
389	7,78	0,364	-1,361	22,737	22,755
390	7,80	0,338	-1,332	22,932	22,949
391	7,82	0,372	-1,308	22,831	22,848
392	7,84	0,387	-1,230	22,836	22,852
393	7,86	0,326	-1,593	23,008	23,030
394	7,88	0,335	-1,293	22,959	22,975
395	7,90	0,366	-1,373	22,807	22,826
396	7,92	0,427	-1,206	22,865	22,881
397	7,94	0,324	-1,306	22,935	22,951
398	7,96	0,338	-1,185	22,853	22,867
399	7,98	0,320	-1,351	22,955	22,972
400	8,00	0,403	-1,311	22,777	22,795



Berdasarkan grafik diatas, nilai tahanan model kapal menggunakan bulbous bow terjadi pada waktu 4,0 – 4,5 s. Sehingga apabila dirata – ratakan nilai tahanan model kapal 0,794 N.

- Kecepatan 0,569 m/s

Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	-0,030	0,627	4,999	5,595
1	0,02	1,911	3,110	36,121	38,923
2	0,04	1,879	1,287	25,199	26,744
3	0,06	1,686	-1,071	-1,804	8,053
4	0,08	1,799	1,787	9,820	14,026
5	0,10	1,886	2,057	-1,077	11,087
6	0,12	1,812	-0,362	-6,690	9,839
7	0,14	2,085	-0,529	10,562	13,497
8	0,16	1,848	0,318	-5,901	9,401
9	0,18	2,175	-0,566	-11,983	14,854
10	0,20	2,598	-0,559	9,398	14,000
11	0,22	2,609	-1,249	-1,030	11,382
12	0,24	2,815	-0,585	-0,188	11,226
13	0,26	2,914	0,188	13,934	17,997
14	0,28	3,098	-0,740	-1,558	12,536
15	0,30	3,261	-0,397	11,606	17,291
16	0,32	2,897	-0,006	17,391	20,738
17	0,34	2,639	-1,090	-4,563	12,072
18	0,36	2,733	0,165	9,756	14,464
19	0,38	2,422	0,313	8,734	12,925
20	0,40	2,365	-1,642	-8,254	14,011
21	0,42	2,222	-0,267	5,312	10,221
22	0,44	2,162	-0,002	-2,735	8,865
23	0,46	2,335	-1,156	-8,904	13,550
24	0,48	2,108	-0,398	4,534	9,524
25	0,50	2,172	-0,654	-6,933	11,255
26	0,52	2,384	-0,490	-2,525	9,831
27	0,54	2,163	-0,340	5,931	10,400
28	0,56	2,131	-1,216	-6,291	11,503
29	0,58	2,207	-0,131	5,006	9,971
30	0,60	2,082	0,270	7,002	10,777
31	0,62	2,053	-1,194	-5,093	10,623
32	0,64	2,017	-0,210	5,777	9,795
33	0,66	1,898	0,021	2,407	7,784
34	0,68	1,950	-0,954	-4,476	9,612
35	0,70	1,800	-0,221	3,543	7,913
36	0,72	1,841	-0,425	-4,218	8,497
37	0,74	1,899	-0,833	-3,836	8,981
38	0,76	1,738	-0,511	2,329	7,454
39	0,78	1,799	-0,998	-6,332	10,259
40	0,80	1,844	-0,674	-0,432	7,693
41	0,82	1,733	-0,410	2,377	7,349
42	0,84	1,764	-0,913	-4,460	8,975
43	0,86	1,782	-0,328	2,754	7,590
44	0,88	1,691	-0,388	1,449	6,930
45	0,90	1,762	-0,845	-3,131	8,274
46	0,92	1,649	-0,172	3,547	7,375
47	0,94	1,649	-0,468	-1,465	6,858
48	0,96	1,673	-0,501	-2,321	7,208
49	0,98	1,578	-0,054	2,321	6,582
50	1,00	1,596	-0,508	-4,059	7,705

51	1,02	1,595	-0,369	-1,637	6,599
52	1,04	1,515	-0,047	1,597	6,125
53	1,06	1,547	-0,646	-4,353	7,875
54	1,08	1,553	-0,136	1,086	6,179
55	1,10	1,512	-0,093	1,365	6,065
56	1,12	1,521	-0,665	-2,872	7,105
57	1,14	1,465	-0,010	3,123	6,511
58	1,16	1,447	-0,079	1,069	5,751
59	1,18	1,463	-0,495	-1,207	6,159
60	1,20	1,386	-0,126	3,657	6,547
61	1,22	1,418	-0,332	-0,415	5,702
62	1,24	1,395	-0,392	0,111	5,662
63	1,26	1,354	-0,020	3,510	6,341
64	1,28	1,343	-0,395	-1,333	5,629
65	1,30	1,332	-0,216	1,892	5,595
66	1,32	1,295	-0,005	3,198	5,978
67	1,34	1,301	-0,490	-0,882	5,512
68	1,36	1,281	-0,128	3,394	6,061
69	1,38	1,244	-0,053	3,044	5,730
70	1,40	1,282	-0,436	0,495	5,317
71	1,42	1,192	-0,087	4,631	6,570
72	1,44	1,197	-0,062	2,435	5,270
73	1,46	1,208	-0,142	2,034	5,163
74	1,48	1,146	0,046	5,207	6,864
75	1,50	1,161	-0,239	1,581	4,890
76	1,52	1,168	-0,182	3,115	5,565
77	1,54	1,112	0,015	4,957	6,587
78	1,56	1,103	-0,382	1,469	4,797
79	1,58	1,105	-0,161	4,397	6,192
80	1,60	1,060	-0,015	5,005	6,492
81	1,62	1,086	-0,354	2,306	5,026
82	1,64	1,041	-0,113	5,400	6,771
83	1,66	1,048	-0,063	4,627	6,180
84	1,68	1,051	-0,211	3,485	5,445
85	1,70	1,001	-0,054	6,182	7,314
86	1,72	0,994	-0,168	4,136	5,709
87	1,74	0,999	-0,119	4,659	6,091
88	1,76	0,959	0,060	6,558	7,554
89	1,78	0,928	-0,235	3,839	5,359
90	1,80	0,946	-0,085	5,338	6,498
91	1,82	0,902	0,115	6,492	7,397
92	1,84	0,916	-0,175	4,106	5,488
93	1,86	0,870	-0,091	5,938	6,849
94	1,88	0,869	0,085	6,187	7,063
95	1,90	0,882	-0,048	4,836	5,938
96	1,92	0,816	-0,042	6,842	7,548
97	1,94	0,836	0,037	5,972	6,807
98	1,96	0,835	0,020	5,861	6,706
99	1,98	0,806	0,117	7,550	8,191
100	2,00	0,774	-0,060	5,841	6,580

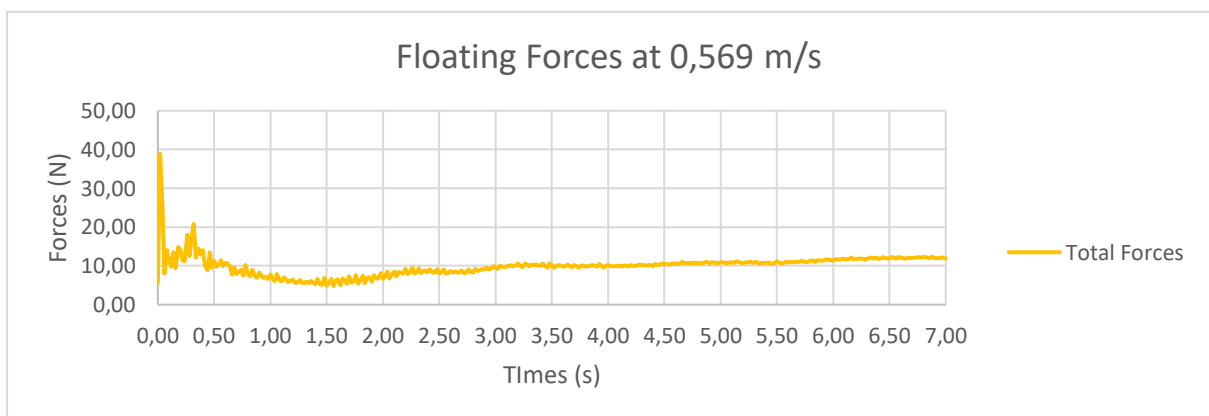
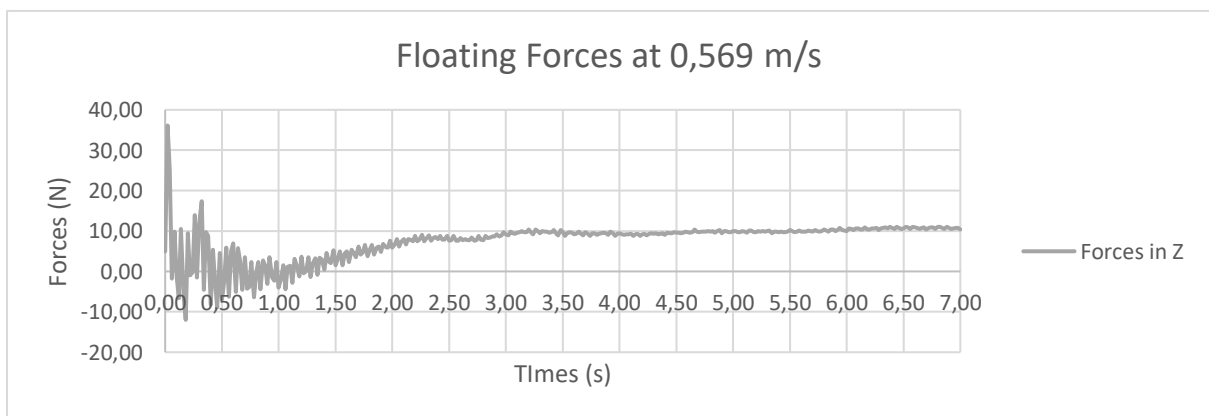
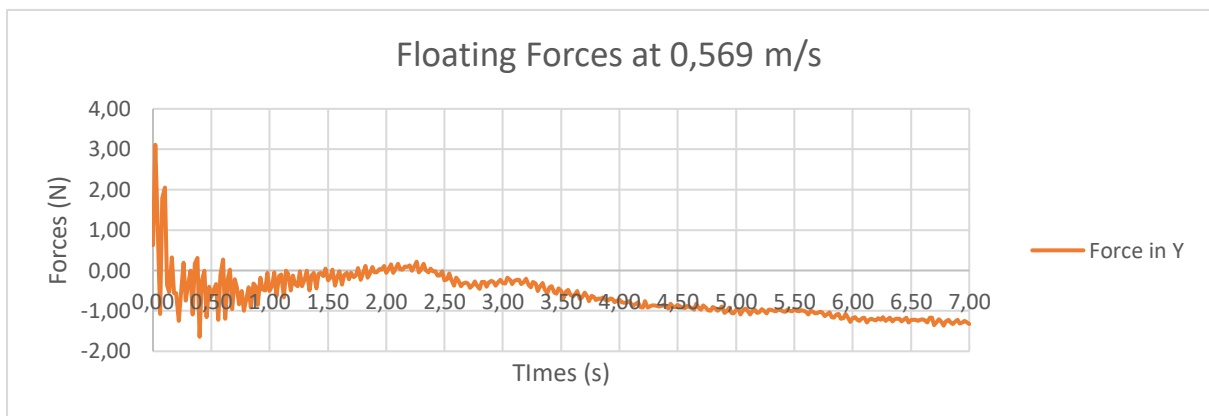
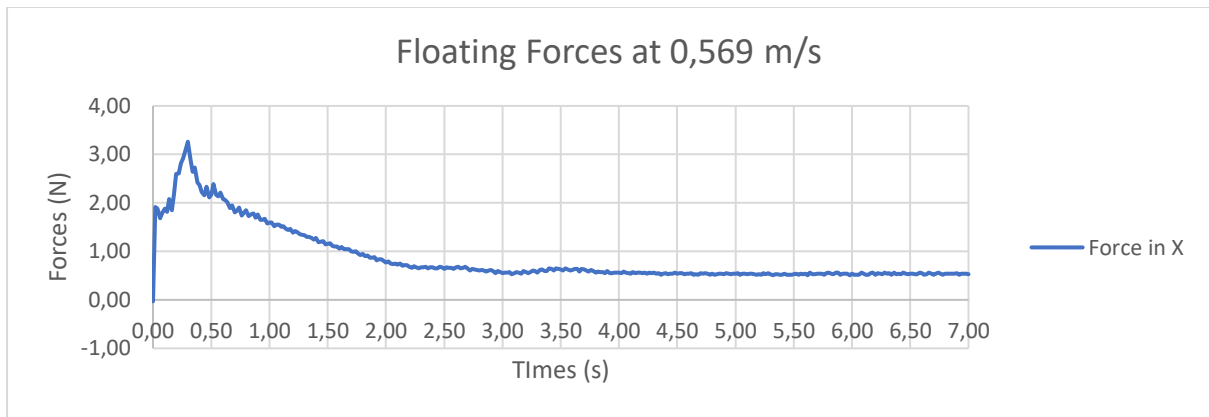
101	2,02	0,788	0,039	6,663	7,339
102	2,04	0,753	0,152	7,944	8,492
103	2,06	0,739	-0,060	6,135	6,783
104	2,08	0,744	0,031	7,314	7,869
105	2,10	0,726	0,160	8,004	8,515
106	2,12	0,745	0,032	6,666	7,273
107	2,14	0,701	0,017	8,011	8,465
108	2,16	0,718	0,103	7,823	8,320
109	2,18	0,716	0,082	7,437	7,950
110	2,20	0,683	0,128	8,775	9,184
111	2,22	0,661	-0,011	7,413	7,848
112	2,24	0,696	0,093	7,882	8,344
113	2,26	0,668	0,216	9,074	9,480
114	2,28	0,648	-0,051	7,526	7,942
115	2,30	0,677	0,026	8,081	8,502
116	2,32	0,670	0,165	8,982	9,378
117	2,34	0,684	0,006	7,634	8,087
118	2,36	0,653	-0,044	8,259	8,644
119	2,38	0,667	0,046	8,477	8,870
120	2,40	0,667	-0,025	7,947	8,363
121	2,42	0,650	-0,024	8,741	9,101
122	2,44	0,648	-0,123	7,885	8,295
123	2,46	0,688	-0,120	7,852	8,312
124	2,48	0,669	-0,016	8,729	9,111
125	2,50	0,637	-0,242	7,640	8,092
126	2,52	0,675	-0,215	7,794	8,272
127	2,54	0,659	-0,070	8,735	9,109
128	2,56	0,662	-0,234	7,552	8,036
129	2,58	0,642	-0,373	7,573	8,115
130	2,60	0,675	-0,174	8,318	8,753
131	2,62	0,683	-0,239	7,725	8,227
132	2,64	0,648	-0,388	8,051	8,580
133	2,66	0,660	-0,327	7,795	8,312
134	2,68	0,687	-0,297	7,693	8,233
135	2,70	0,651	-0,319	8,406	8,874
136	2,72	0,607	-0,433	7,658	8,201
137	2,74	0,644	-0,362	7,728	8,254
138	2,76	0,626	-0,271	8,747	9,146
139	2,78	0,616	-0,375	7,897	8,390
140	2,80	0,600	-0,458	7,798	8,345
141	2,82	0,616	-0,286	8,816	9,209
142	2,84	0,610	-0,284	8,282	8,691
143	2,86	0,581	-0,408	8,408	8,859
144	2,88	0,610	-0,298	8,666	9,065
145	2,90	0,615	-0,254	8,716	9,097
146	2,92	0,595	-0,284	9,160	9,517
147	2,94	0,552	-0,382	8,669	9,062
148	2,96	0,594	-0,282	8,932	9,296
149	2,98	0,568	-0,227	9,663	9,956
150	3,00	0,548	-0,304	9,237	9,559

151	3,02	0,561	-0,328	8,920	9,278
152	3,04	0,566	-0,174	9,790	10,060
153	3,06	0,567	-0,230	9,479	9,777
154	3,08	0,529	-0,334	9,321	9,640
155	3,10	0,556	-0,256	9,621	9,916
156	3,12	0,576	-0,230	9,658	9,959
157	3,14	0,564	-0,229	9,918	10,200
158	3,16	0,536	-0,335	9,655	9,970
159	3,18	0,591	-0,288	9,670	10,008
160	3,20	0,575	-0,200	10,330	10,601
161	3,22	0,548	-0,357	9,736	10,070
162	3,24	0,576	-0,416	9,218	9,632
163	3,26	0,602	-0,280	10,331	10,653
164	3,28	0,594	-0,319	9,943	10,289
165	3,30	0,563	-0,510	9,496	9,957
166	3,32	0,613	-0,398	9,965	10,371
167	3,34	0,631	-0,316	9,807	10,190
168	3,36	0,593	-0,467	9,865	10,303
169	3,38	0,593	-0,559	9,581	10,106
170	3,40	0,653	-0,416	9,661	10,129
171	3,42	0,642	-0,383	10,203	10,617
172	3,44	0,611	-0,553	9,410	9,956
173	3,46	0,648	-0,574	8,896	9,529
174	3,48	0,636	-0,442	10,211	10,655
175	3,50	0,629	-0,503	9,671	10,178
176	3,52	0,611	-0,690	8,792	9,518
177	3,54	0,655	-0,522	9,413	9,974
178	3,56	0,627	-0,480	9,705	10,190
179	3,58	0,609	-0,597	9,533	10,111
180	3,60	0,622	-0,634	9,134	9,785
181	3,62	0,635	-0,581	9,336	9,935
182	3,64	0,641	-0,512	9,795	10,313
183	3,66	0,586	-0,709	9,288	9,976
184	3,68	0,639	-0,669	8,929	9,649
185	3,70	0,623	-0,542	9,718	10,249
186	3,72	0,603	-0,625	9,367	9,976
187	3,74	0,584	-0,762	8,788	9,576
188	3,76	0,620	-0,623	9,503	10,117
189	3,78	0,599	-0,656	9,459	10,091
190	3,80	0,565	-0,729	9,092	9,800
191	3,82	0,584	-0,691	9,317	9,982
192	3,84	0,577	-0,705	9,391	10,061
193	3,86	0,578	-0,666	9,594	10,209
194	3,88	0,552	-0,738	9,426	10,110
195	3,90	0,599	-0,745	9,042	9,803
196	3,92	0,551	-0,688	9,812	10,414
197	3,94	0,555	-0,709	9,391	10,046
198	3,96	0,564	-0,782	8,786	9,581
199	3,98	0,565	-0,739	9,385	10,083
200	4,00	0,566	-0,723	9,466	10,141

201	4,02	0,553	-0,786	9,204	9,962
202	4,04	0,588	-0,800	9,051	9,871
203	4,06	0,562	-0,804	9,130	9,925
204	4,08	0,552	-0,758	9,218	9,940
205	4,10	0,545	-0,829	9,297	10,096
206	4,12	0,578	-0,863	8,831	9,746
207	4,14	0,548	-0,824	9,231	10,033
208	4,16	0,557	-0,789	9,371	10,124
209	4,18	0,560	-0,903	8,787	9,748
210	4,20	0,547	-0,919	9,211	10,145
211	4,22	0,563	-0,756	9,365	10,084
212	4,24	0,541	-0,919	8,971	9,922
213	4,26	0,564	-0,896	9,295	10,201
214	4,28	0,547	-0,867	9,439	10,280
215	4,30	0,557	-0,861	9,322	10,172
216	4,32	0,537	-0,874	9,408	10,253
217	4,34	0,552	-0,885	9,181	10,072
218	4,36	0,522	-0,874	9,384	10,219
219	4,38	0,536	-0,849	9,433	10,241
220	4,40	0,550	-0,901	9,015	9,943
221	4,42	0,526	-0,939	9,552	10,467
222	4,44	0,544	-0,821	9,477	10,251
223	4,46	0,538	-0,910	9,406	10,301
224	4,48	0,560	-0,906	9,749	10,627
225	4,50	0,542	-0,857	9,539	10,354
226	4,52	0,552	-0,887	9,560	10,422
227	4,54	0,550	-0,913	9,389	10,299
228	4,56	0,534	-0,934	9,614	10,523
229	4,58	0,536	-0,875	9,837	10,648
230	4,60	0,541	-0,903	9,772	10,630
231	4,62	0,547	-0,925	9,599	10,507
232	4,64	0,523	-0,966	9,694	10,634
233	4,66	0,526	-0,825	10,382	11,085
234	4,68	0,522	-0,933	9,814	10,695
235	4,70	0,556	-0,968	9,755	10,716
236	4,72	0,541	-0,869	9,891	10,694
237	4,74	0,546	-0,913	9,865	10,732
238	4,76	0,541	-0,985	9,855	10,821
239	4,78	0,522	-0,992	10,012	10,961
240	4,80	0,536	-0,907	9,826	10,680
241	4,82	0,518	-0,936	9,931	10,804
242	4,84	0,531	-0,990	9,588	10,578
243	4,86	0,537	-0,956	10,028	10,935
244	4,88	0,536	-0,896	10,290	11,095
245	4,90	0,528	-1,051	9,486	10,578
246	4,92	0,554	-1,009	9,951	10,953
247	4,94	0,539	-0,921	9,966	10,831
248	4,96	0,527	-1,048	9,728	10,791
249	4,98	0,540	-1,063	9,710	10,807
250	5,00	0,545	-0,966	9,958	10,891

251	5,02	0,548	-0,954	10,045	10,956
252	5,04	0,519	-1,093	9,778	10,900
253	5,06	0,537	-0,979	9,698	10,667
254	5,08	0,538	-0,948	9,961	10,863
255	5,10	0,524	-1,007	9,908	10,889
256	5,12	0,538	-1,089	9,600	10,749
257	5,14	0,541	-1,010	10,152	11,129
258	5,16	0,533	-0,968	10,162	11,071
259	5,18	0,516	-1,052	9,674	10,740
260	5,20	0,534	-1,041	9,676	10,737
261	5,22	0,522	-0,959	9,984	10,887
262	5,24	0,548	-0,992	9,879	10,859
263	5,26	0,525	-1,064	9,928	10,994
264	5,28	0,548	-0,976	9,784	10,749
265	5,30	0,525	-0,971	10,003	10,924
266	5,32	0,511	-0,998	10,048	10,994
267	5,34	0,530	-1,009	9,482	10,511
268	5,36	0,527	-0,980	9,792	10,747
269	5,38	0,515	-0,965	9,872	10,788
270	5,40	0,521	-1,010	9,765	10,761
271	5,42	0,542	-1,023	9,834	10,859
272	5,44	0,515	-0,969	9,745	10,678
273	5,46	0,516	-0,991	9,713	10,682
274	5,48	0,514	-1,008	9,797	10,782
275	5,50	0,526	-0,950	10,240	11,114
276	5,52	0,540	-0,992	9,967	10,934
277	5,54	0,521	-1,012	9,669	10,678
278	5,56	0,544	-0,988	9,796	10,775
279	5,58	0,532	-0,996	10,104	11,057
280	5,60	0,538	-1,020	9,905	10,915
281	5,62	0,511	-1,090	9,877	10,979
282	5,64	0,558	-1,002	9,881	10,883
283	5,66	0,531	-1,021	10,075	11,067
284	5,68	0,526	-1,061	10,038	11,089
285	5,70	0,542	-1,052	9,910	10,971
286	5,72	0,540	-1,023	10,275	11,258
287	5,74	0,539	-1,031	10,040	11,055
288	5,76	0,514	-1,131	9,823	10,999
289	5,78	0,554	-1,087	9,918	11,043
290	5,80	0,557	-1,040	10,405	11,414
291	5,82	0,537	-1,156	10,076	11,282
292	5,84	0,529	-1,167	9,833	11,078
293	5,86	0,557	-1,083	10,368	11,444
294	5,88	0,560	-1,071	10,406	11,464
295	5,90	0,518	-1,189	9,997	11,253
296	5,92	0,539	-1,175	10,215	11,438
297	5,94	0,542	-1,081	10,716	11,747
298	5,96	0,536	-1,186	10,297	11,529
299	5,98	0,507	-1,275	10,047	11,440
300	6,00	0,540	-1,177	10,016	11,266

301	6,02	0,521	-1,154	10,592	11,732
302	6,04	0,515	-1,220	10,456	11,712
303	6,06	0,519	-1,240	10,206	11,527
304	6,08	0,561	-1,185	10,584	11,801
305	6,10	0,540	-1,167	10,591	11,764
306	6,12	0,519	-1,290	10,387	11,774
307	6,14	0,520	-1,221	10,424	11,688
308	6,16	0,549	-1,192	10,924	12,110
309	6,18	0,564	-1,220	10,409	11,705
310	6,20	0,516	-1,238	10,365	11,662
311	6,22	0,547	-1,183	10,666	11,862
312	6,24	0,539	-1,217	10,647	11,894
313	6,26	0,527	-1,154	10,737	11,866
314	6,28	0,558	-1,245	10,235	11,588
315	6,30	0,537	-1,208	10,629	11,861
316	6,32	0,547	-1,174	10,789	11,959
317	6,34	0,517	-1,255	10,851	12,125
318	6,36	0,558	-1,213	10,601	11,860
319	6,38	0,532	-1,189	11,008	12,171
320	6,40	0,535	-1,188	10,718	11,909
321	6,42	0,524	-1,256	10,560	11,871
322	6,44	0,560	-1,225	11,017	12,254
323	6,46	0,537	-1,174	10,759	11,925
324	6,48	0,530	-1,290	10,550	11,925
325	6,50	0,536	-1,225	10,609	11,871
326	6,52	0,545	-1,222	11,084	12,298
327	6,54	0,530	-1,225	10,918	12,145
328	6,56	0,530	-1,249	10,573	11,876
329	6,58	0,557	-1,218	10,995	12,221
330	6,60	0,545	-1,205	10,864	12,074
331	6,62	0,519	-1,236	10,714	11,973
332	6,64	0,526	-1,282	10,478	11,845
333	6,66	0,557	-1,168	10,837	11,999
334	6,68	0,543	-1,166	10,965	12,103
335	6,70	0,514	-1,352	10,441	11,927
336	6,72	0,535	-1,270	10,815	12,130
337	6,74	0,558	-1,207	10,880	12,100
338	6,76	0,542	-1,262	10,921	12,216
339	6,78	0,523	-1,365	10,565	12,067
340	6,80	0,545	-1,260	10,984	12,270
341	6,82	0,538	-1,217	11,002	12,213
342	6,84	0,536	-1,281	10,736	12,078
343	6,86	0,542	-1,330	10,573	12,024
344	6,88	0,538	-1,263	11,067	12,346
345	6,90	0,549	-1,217	10,784	12,024
346	6,92	0,520	-1,319	10,540	11,960
347	6,94	0,544	-1,283	10,682	12,039
348	6,96	0,538	-1,253	10,815	12,103
349	6,98	0,541	-1,283	10,721	12,072
350	7,00	0,528	-1,327	10,390	11,847



Berdasarkan grafik diatas, nilai tahanan model kapal menggunakan *bulbous bow* terjadi pada waktu 5,0 – 5,5 s. Sehingga apabila dirata – ratakan nilai tahanan model kapal 1,058 N.

- Kecepatan 0,650 m/s

Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	0,184	-2,943	-0,412	2,395
1	0,02	4,177	22,783	42,641	46,390
2	0,04	4,591	9,861	52,706	53,311
3	0,06	4,121	-3,946	19,846	20,118
4	0,08	4,702	-4,618	37,316	37,508
5	0,10	5,795	9,180	29,443	30,367
6	0,12	5,767	-2,733	23,348	23,460
7	0,14	5,785	-6,411	31,727	32,147
8	0,16	5,873	1,564	9,258	9,361
9	0,18	5,883	-1,028	16,964	16,994
10	0,20	5,800	-8,357	28,207	28,996
11	0,22	5,670	-1,802	13,359	13,454
12	0,24	5,792	-5,200	14,583	15,178
13	0,26	5,476	-2,387	24,321	24,400
14	0,28	5,499	-2,464	21,638	21,733
15	0,30	5,376	-6,498	23,409	23,980
16	0,32	5,605	-0,437	32,509	32,513
17	0,34	5,560	-4,714	24,903	25,191
18	0,36	5,118	-2,444	32,164	32,226
19	0,38	4,777	-1,530	37,061	37,088
20	0,40	4,718	-4,808	20,198	20,567
21	0,42	4,668	0,117	34,205	34,211
22	0,44	4,424	-2,876	29,816	29,909
23	0,46	4,452	-1,368	19,287	19,324
24	0,48	4,251	0,996	32,850	32,865
25	0,50	4,132	-2,837	22,337	22,455
26	0,52	4,024	-0,728	21,871	21,884
27	0,54	3,724	-0,454	28,383	28,387
28	0,56	3,238	-0,304	19,118	19,121
29	0,58	3,163	-1,577	22,445	22,482
30	0,60	3,188	-0,548	24,718	24,723
31	0,62	3,084	-0,324	19,072	19,076
32	0,64	3,002	-1,984	24,008	24,064
33	0,66	3,143	-0,481	24,394	24,401
34	0,68	3,082	-1,149	20,518	20,542
35	0,70	3,066	-0,834	26,462	26,474
36	0,72	3,112	-1,069	24,588	24,606
37	0,74	3,144	-0,796	23,081	23,091
38	0,76	3,116	-0,797	28,564	28,574
39	0,78	2,960	-0,486	25,273	25,277
40	0,80	2,890	-0,482	24,331	24,337
41	0,82	2,520	-0,834	28,163	28,172
42	0,84	2,479	-0,298	23,380	23,384
43	0,86	2,458	-0,252	24,606	24,609
44	0,88	2,486	-0,492	26,655	26,660
45	0,90	2,391	-0,436	21,736	21,742
46	0,92	2,265	-0,053	24,899	24,901
47	0,94	2,018	-0,325	24,912	24,916
48	0,96	1,752	-0,479	21,407	21,414
49	0,98	1,720	0,393	25,504	25,508
50	1,00	1,765	-0,313	23,580	23,584

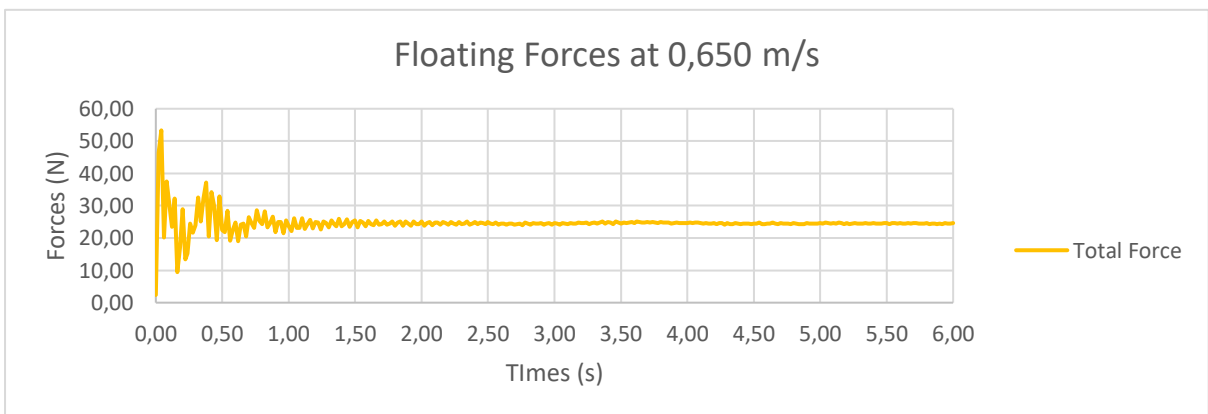
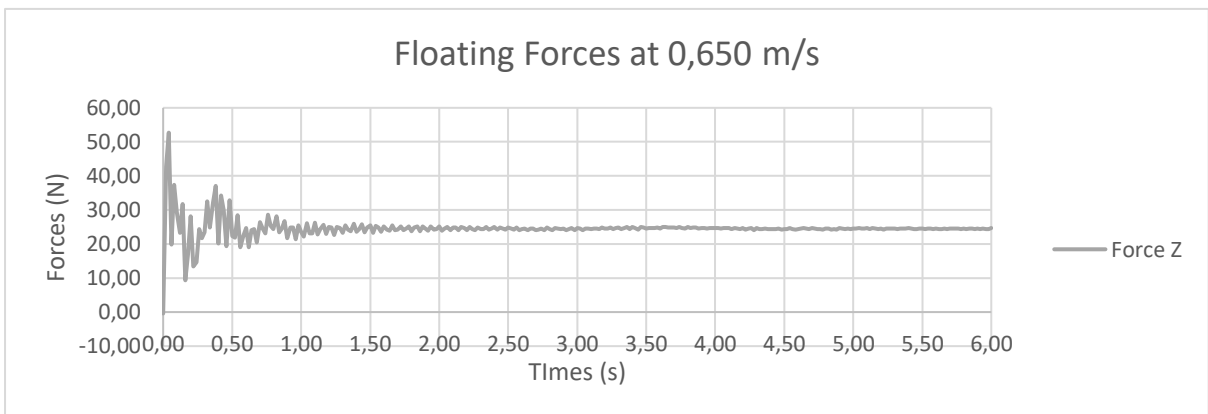
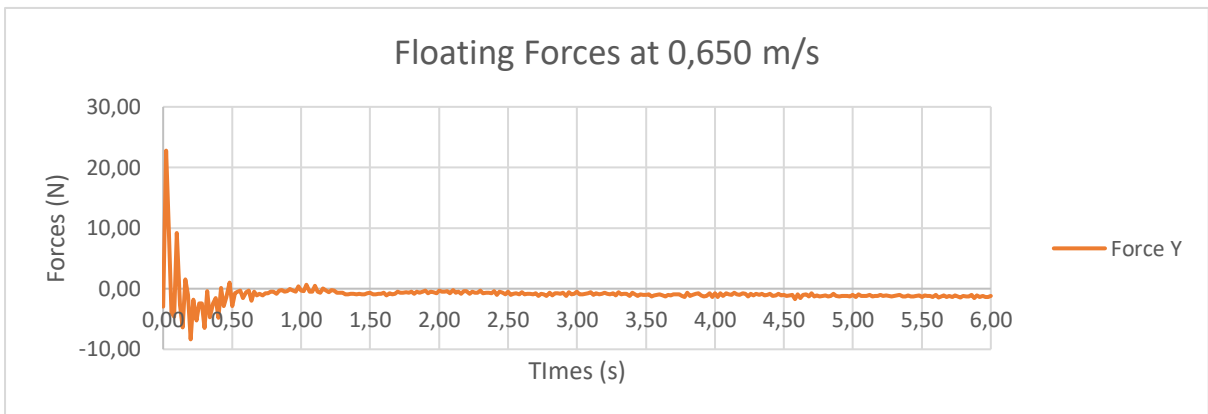
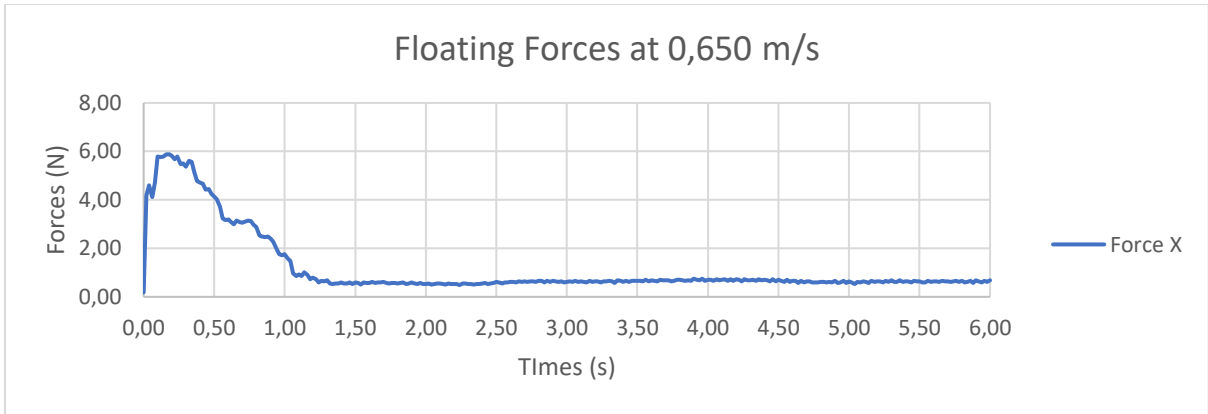
51	1,02	1,589	-0,396	22,185	22,190
52	1,04	1,468	0,648	26,028	26,036
53	1,06	0,969	-0,478	23,076	23,082
54	1,08	0,859	-0,458	23,149	23,154
55	1,10	0,920	0,485	26,176	26,181
56	1,12	0,860	-0,483	22,854	22,859
57	1,14	1,002	-0,645	24,333	24,342
58	1,16	0,903	0,064	25,675	25,677
59	1,18	0,724	-0,333	22,916	22,920
60	1,20	0,794	-0,577	24,936	24,943
61	1,22	0,724	-0,238	24,797	24,800
62	1,24	0,603	-0,325	22,716	22,721
63	1,26	0,664	-0,656	25,030	25,039
64	1,28	0,644	-0,694	24,616	24,625
65	1,30	0,689	-0,708	23,318	23,328
66	1,32	0,558	-0,904	25,444	25,457
67	1,34	0,524	-0,966	24,238	24,254
68	1,36	0,542	-0,854	23,671	23,685
69	1,38	0,546	-0,854	25,969	25,981
70	1,40	0,595	-0,890	23,593	23,608
71	1,42	0,549	-0,840	24,297	24,310
72	1,44	0,555	-0,970	25,818	25,833
73	1,46	0,595	-0,915	23,423	23,439
74	1,48	0,536	-0,786	24,905	24,916
75	1,50	0,597	-0,656	25,473	25,482
76	1,52	0,575	-0,973	23,334	23,351
77	1,54	0,516	-0,890	25,290	25,303
78	1,56	0,591	-0,866	24,851	24,864
79	1,58	0,578	-0,815	23,621	23,634
80	1,60	0,582	-0,685	25,220	25,230
81	1,62	0,616	-1,074	24,252	24,272
82	1,64	0,579	-0,722	23,905	23,915
83	1,66	0,592	-0,938	25,394	25,409
84	1,68	0,587	-0,820	24,108	24,121
85	1,70	0,607	-0,519	24,288	24,296
86	1,72	0,579	-0,659	25,077	25,086
87	1,74	0,546	-0,676	24,098	24,107
88	1,76	0,582	-0,613	24,510	24,518
89	1,78	0,582	-0,656	25,108	25,117
90	1,80	0,558	-0,528	23,721	23,728
91	1,82	0,566	-0,858	24,794	24,807
92	1,84	0,591	-0,464	25,136	25,143
93	1,86	0,526	-0,676	23,719	23,729
94	1,88	0,558	-0,533	25,177	25,184
95	1,90	0,589	-0,341	24,515	24,520
96	1,92	0,542	-0,776	23,863	23,874
97	1,94	0,536	-0,486	25,139	25,145
98	1,96	0,572	-0,590	24,248	24,257
99	1,98	0,517	-0,739	24,320	24,330
100	2,00	0,528	-0,307	25,101	25,105

101	2,02	0,551	-0,475	23,837	23,844
102	2,04	0,497	-0,454	24,575	24,581
103	2,06	0,517	-0,397	24,938	24,943
104	2,08	0,549	-0,729	24,001	24,011
105	2,10	0,540	-0,256	24,813	24,817
106	2,12	0,525	-0,663	24,821	24,830
107	2,14	0,509	-0,449	24,065	24,070
108	2,16	0,558	-0,853	24,958	24,971
109	2,18	0,524	-0,366	24,643	24,648
110	2,20	0,538	-0,362	24,108	24,113
111	2,22	0,528	-0,822	25,019	25,031
112	2,24	0,491	-0,456	24,425	24,431
113	2,26	0,549	-0,652	24,127	24,136
114	2,28	0,551	-0,707	24,906	24,916
115	2,30	0,534	-0,306	24,366	24,370
116	2,32	0,533	-0,733	24,377	24,387
117	2,34	0,503	-0,679	25,063	25,072
118	2,36	0,525	-0,641	24,190	24,198
119	2,38	0,536	-0,797	24,450	24,462
120	2,40	0,553	-0,428	24,997	25,003
121	2,42	0,583	-1,020	24,250	24,268
122	2,44	0,532	-0,523	24,847	24,854
123	2,46	0,553	-0,701	24,576	24,586
124	2,48	0,561	-0,908	24,284	24,299
125	2,50	0,618	-0,464	24,892	24,899
126	2,52	0,595	-0,979	24,499	24,516
127	2,54	0,559	-0,869	24,266	24,280
128	2,56	0,586	-0,766	24,797	24,808
129	2,58	0,591	-0,923	24,124	24,140
130	2,60	0,622	-0,615	24,391	24,401
131	2,62	0,611	-0,935	24,498	24,513
132	2,64	0,598	-0,872	24,074	24,089
133	2,66	0,632	-0,825	24,451	24,464
134	2,68	0,617	-0,972	24,523	24,539
135	2,70	0,640	-0,737	24,043	24,055
136	2,72	0,623	-1,171	24,285	24,307
137	2,74	0,641	-0,818	24,496	24,509
138	2,76	0,636	-0,913	24,006	24,022
139	2,78	0,612	-1,194	24,802	24,825
140	2,80	0,652	-0,650	24,404	24,414
141	2,82	0,655	-1,074	24,126	24,146
142	2,84	0,597	-0,797	24,622	24,634
143	2,86	0,656	-0,792	24,455	24,468
144	2,88	0,622	-0,887	24,406	24,421
145	2,90	0,659	-0,693	24,600	24,611
146	2,92	0,646	-1,204	24,117	24,141
147	2,94	0,607	-0,539	24,430	24,438
148	2,96	0,636	-0,967	24,689	24,706
149	2,98	0,604	-0,849	24,046	24,059
150	3,00	0,626	-0,515	24,629	24,637

151	3,02	0,638	-0,945	24,494	24,510
152	3,04	0,606	-0,888	24,087	24,102
153	3,06	0,665	-0,844	24,547	24,562
154	3,08	0,611	-0,767	24,463	24,475
155	3,10	0,634	-0,584	24,309	24,318
156	3,12	0,623	-1,047	24,604	24,622
157	3,14	0,589	-0,785	24,509	24,521
158	3,16	0,668	-0,903	24,362	24,378
159	3,18	0,623	-0,820	24,795	24,808
160	3,20	0,636	-0,709	24,545	24,556
161	3,22	0,633	-0,875	24,567	24,582
162	3,24	0,602	-0,975	24,764	24,780
163	3,26	0,639	-0,738	24,322	24,334
164	3,28	0,629	-1,094	24,676	24,696
165	3,30	0,655	-0,564	24,787	24,796
166	3,32	0,636	-0,952	24,398	24,415
167	3,34	0,582	-0,845	24,729	24,742
168	3,36	0,676	-0,862	25,038	25,052
169	3,38	0,657	-1,225	24,414	24,439
170	3,40	0,612	-0,636	24,965	24,975
171	3,42	0,668	-0,930	24,758	24,775
172	3,44	0,606	-1,223	24,273	24,297
173	3,46	0,665	-0,951	25,045	25,061
174	3,48	0,655	-1,060	24,843	24,862
175	3,50	0,670	-0,978	24,523	24,541
176	3,52	0,658	-0,927	24,757	24,773
177	3,54	0,632	-1,245	24,619	24,644
178	3,56	0,695	-1,080	24,731	24,752
179	3,58	0,648	-0,987	24,882	24,899
180	3,60	0,673	-0,926	24,540	24,556
181	3,62	0,666	-1,136	25,018	25,039
182	3,64	0,634	-1,307	24,924	24,951
183	3,66	0,694	-1,017	24,843	24,861
184	3,68	0,675	-1,151	24,807	24,829
185	3,70	0,673	-0,976	24,887	24,904
186	3,72	0,672	-0,947	24,695	24,712
187	3,74	0,637	-0,908	24,952	24,967
188	3,76	0,669	-1,189	24,702	24,725
189	3,78	0,694	-1,332	24,582	24,610
190	3,80	0,712	-0,638	24,978	24,989
191	3,82	0,682	-1,206	24,743	24,767
192	3,84	0,667	-1,053	24,834	24,854
193	3,86	0,693	-0,878	24,775	24,791
194	3,88	0,654	-0,792	24,486	24,499
195	3,90	0,752	-1,132	24,650	24,673
196	3,92	0,712	-1,257	24,704	24,730
197	3,94	0,683	-1,169	24,585	24,608
198	3,96	0,744	-0,763	24,636	24,650
199	3,98	0,668	-1,363	24,667	24,696
200	4,00	0,704	-0,737	24,647	24,659

201	4,02	0,709	-1,335	24,690	24,719
202	4,04	0,664	-0,776	24,556	24,569
203	4,06	0,729	-1,160	24,751	24,774
204	4,08	0,687	-0,794	24,725	24,738
205	4,10	0,696	-0,949	24,685	24,702
206	4,12	0,717	-1,030	24,424	24,444
207	4,14	0,667	-0,674	24,609	24,620
208	4,16	0,730	-0,941	24,507	24,525
209	4,18	0,669	-0,983	24,423	24,441
210	4,20	0,728	-0,788	24,631	24,645
211	4,22	0,712	-0,814	24,224	24,239
212	4,24	0,629	-1,250	24,575	24,600
213	4,26	0,721	-0,853	24,624	24,640
214	4,28	0,675	-1,072	24,055	24,075
215	4,30	0,690	-0,807	24,635	24,649
216	4,32	0,710	-0,978	24,334	24,353
217	4,34	0,649	-0,853	24,359	24,373
218	4,36	0,733	-1,134	24,539	24,562
219	4,38	0,678	-1,029	24,380	24,399
220	4,40	0,696	-0,865	24,346	24,362
221	4,42	0,691	-1,236	24,362	24,388
222	4,44	0,628	-1,100	24,390	24,410
223	4,46	0,721	-0,823	24,480	24,495
224	4,48	0,628	-1,082	24,262	24,282
225	4,50	0,697	-1,018	24,395	24,414
226	4,52	0,651	-1,222	24,381	24,406
227	4,54	0,606	-1,086	24,759	24,778
228	4,56	0,704	-0,987	24,350	24,369
229	4,58	0,618	-1,691	24,275	24,317
230	4,60	0,667	-0,957	24,389	24,406
231	4,62	0,651	-1,536	24,462	24,498
232	4,64	0,570	-1,055	24,716	24,734
233	4,66	0,660	-0,932	24,472	24,488
234	4,68	0,586	-1,244	24,321	24,345
235	4,70	0,647	-0,789	24,642	24,654
236	4,72	0,649	-1,242	24,515	24,540
237	4,74	0,598	-1,145	24,389	24,410
238	4,76	0,601	-1,310	24,413	24,439
239	4,78	0,584	-1,198	24,253	24,276
240	4,80	0,621	-1,128	24,545	24,566
241	4,82	0,621	-1,296	24,495	24,522
242	4,84	0,602	-1,227	24,289	24,313
243	4,86	0,624	-0,879	24,298	24,312
244	4,88	0,602	-1,172	24,257	24,279
245	4,90	0,663	-1,248	24,662	24,687
246	4,92	0,574	-1,234	24,471	24,495
247	4,94	0,590	-1,200	24,431	24,453
248	4,96	0,652	-1,178	24,469	24,492
249	4,98	0,576	-1,240	24,359	24,382
250	5,00	0,641	-1,051	24,578	24,597

251	5,02	0,596	-1,381	24,467	24,496
252	5,04	0,529	-0,941	24,724	24,739
253	5,06	0,610	-1,190	24,524	24,546
254	5,08	0,593	-1,208	24,487	24,510
255	5,10	0,637	-1,186	24,667	24,690
256	5,12	0,609	-1,051	24,422	24,441
257	5,14	0,576	-1,244	24,700	24,724
258	5,16	0,657	-1,229	24,580	24,604
259	5,18	0,625	-1,187	24,352	24,375
260	5,20	0,637	-1,004	24,555	24,572
261	5,22	0,628	-1,191	24,225	24,248
262	5,24	0,591	-1,132	24,509	24,529
263	5,26	0,650	-1,216	24,578	24,602
264	5,28	0,607	-1,270	24,509	24,534
265	5,30	0,671	-1,227	24,486	24,511
266	5,32	0,622	-1,143	24,384	24,405
267	5,34	0,608	-1,063	24,542	24,561
268	5,36	0,678	-1,279	24,486	24,512
269	5,38	0,609	-1,296	24,508	24,534
270	5,40	0,648	-1,125	24,618	24,640
271	5,42	0,643	-1,252	24,463	24,488
272	5,44	0,595	-1,250	24,446	24,471
273	5,46	0,667	-1,177	24,381	24,404
274	5,48	0,646	-1,129	24,597	24,618
275	5,50	0,636	-1,358	24,553	24,581
276	5,52	0,594	-1,131	24,330	24,351
277	5,54	0,603	-1,163	24,555	24,577
278	5,56	0,665	-1,198	24,570	24,594
279	5,58	0,626	-1,397	24,402	24,432
280	5,60	0,644	-1,036	24,555	24,574
281	5,62	0,633	-1,472	24,352	24,385
282	5,64	0,609	-1,263	24,432	24,457
283	5,66	0,661	-1,075	24,554	24,574
284	5,68	0,628	-1,411	24,353	24,383
285	5,70	0,645	-1,159	24,593	24,615
286	5,72	0,608	-1,393	24,566	24,596
287	5,74	0,631	-1,142	24,479	24,500
288	5,76	0,669	-1,282	24,481	24,508
289	5,78	0,609	-1,428	24,446	24,476
290	5,80	0,658	-1,189	24,530	24,554
291	5,82	0,593	-1,295	24,335	24,361
292	5,84	0,606	-1,274	24,464	24,490
293	5,86	0,649	-0,984	24,461	24,479
294	5,88	0,578	-1,571	24,334	24,370
295	5,90	0,677	-1,083	24,476	24,497
296	5,92	0,628	-1,375	24,314	24,344
297	5,94	0,603	-1,184	24,601	24,623
298	5,96	0,658	-1,394	24,346	24,376
299	5,98	0,618	-1,413	24,410	24,440
300	6,00	0,684	-1,214	24,631	24,655



Berdasarkan grafik diatas, nilai tahanan model kapal menggunakan *bulbous bow* terjadi pada waktu 3,5 – 4,0 s. Sehingga apabila dirata – ratakan nilai tahanan model kapal 1,358 N.

- Kecepatan 0,732 m/s

Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	0,368	-3,140	-0,412	2,395
1	0,02	3,348	22,010	41,999	45,147
2	0,04	4,029	9,480	52,142	52,650
3	0,06	5,883	-2,511	20,002	20,125
4	0,08	5,580	-6,333	35,353	35,679
5	0,10	5,455	8,086	29,314	29,965
6	0,12	5,178	-3,967	23,941	24,138
7	0,14	5,061	-8,652	30,832	31,521
8	0,16	5,132	0,920	10,271	10,323
9	0,18	5,035	-1,644	14,567	14,634
10	0,20	4,921	-10,822	29,728	30,829
11	0,22	4,836	-2,205	13,052	13,177
12	0,24	4,123	-5,149	14,997	15,504
13	0,26	4,293	-4,012	28,626	28,794
14	0,28	3,930	-2,456	21,034	21,123
15	0,30	3,649	-4,888	28,348	28,588
16	0,32	3,288	-1,293	34,820	34,837
17	0,34	3,750	-0,450	26,808	26,820
18	0,36	3,480	-0,662	36,597	36,606
19	0,38	3,250	-0,962	35,823	35,837
20	0,40	3,058	-1,438	22,857	22,892
21	0,42	2,961	-1,473	33,456	33,483
22	0,44	2,333	-1,039	27,276	27,294
23	0,46	1,855	-0,423	19,335	19,346
24	0,48	2,174	0,369	28,754	28,762
25	0,50	1,975	1,013	19,903	19,926
26	0,52	1,731	1,122	20,139	20,169
27	0,54	1,603	2,044	25,685	25,739
28	0,56	1,182	2,038	17,406	17,479
29	0,58	1,256	1,179	20,978	21,003
30	0,60	1,181	1,117	23,648	23,667
31	0,62	1,265	-0,058	17,735	17,742
32	0,64	1,158	-0,296	23,598	23,607
33	0,66	1,213	-0,457	23,942	23,954
34	0,68	1,049	-1,040	20,141	20,164
35	0,70	1,143	-0,659	26,282	26,294
36	0,72	0,973	-0,901	24,597	24,612
37	0,74	0,854	-0,995	23,192	23,209
38	0,76	0,815	-0,199	28,427	28,431
39	0,78	0,767	-0,611	24,723	24,731
40	0,80	0,824	-0,686	24,398	24,407
41	0,82	0,671	-0,094	27,652	27,655
42	0,84	0,770	-0,447	22,982	22,989
43	0,86	0,671	-0,502	24,273	24,279
44	0,88	0,709	-0,337	26,028	26,033
45	0,90	0,699	-0,811	21,378	21,391
46	0,92	0,681	-0,745	24,677	24,687
47	0,94	0,749	-0,654	24,905	24,914
48	0,96	0,641	-0,637	21,491	21,501
49	0,98	0,616	-0,236	25,506	25,511
50	1,00	0,638	-0,046	23,975	23,979

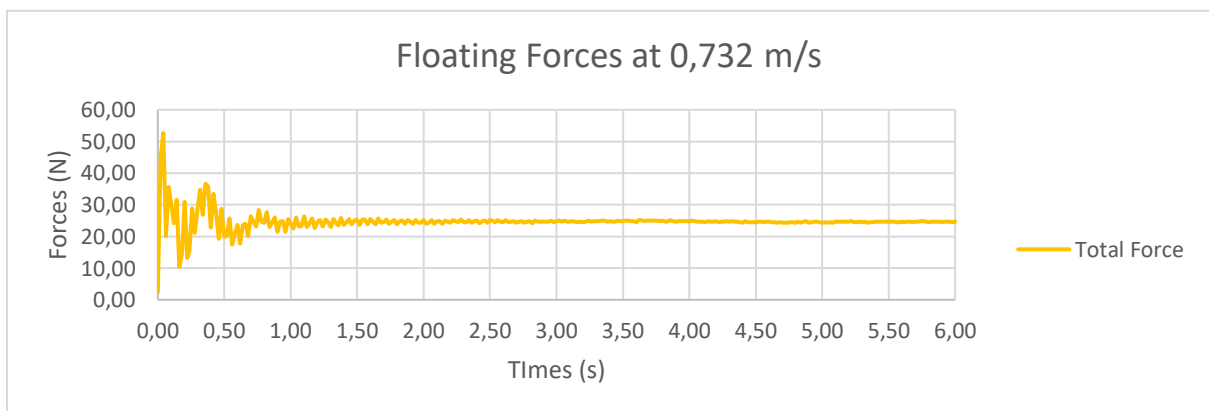
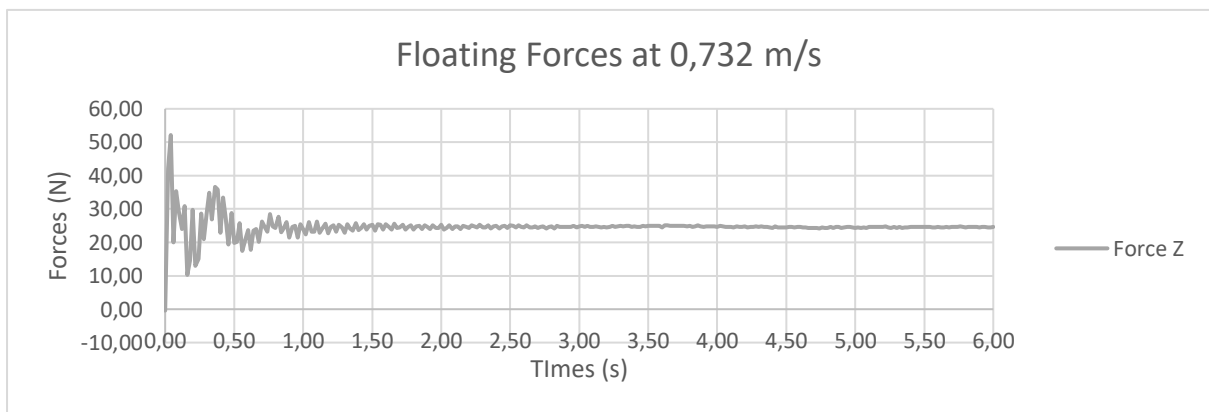
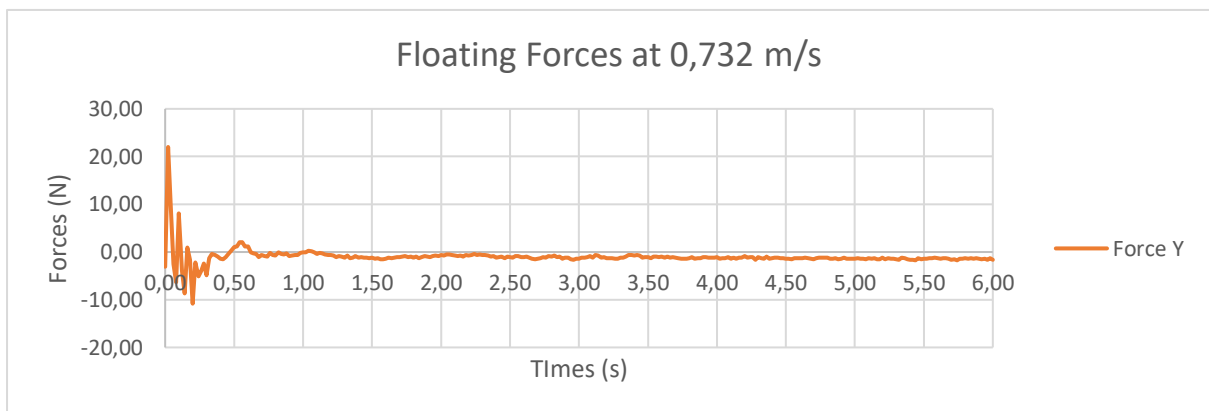
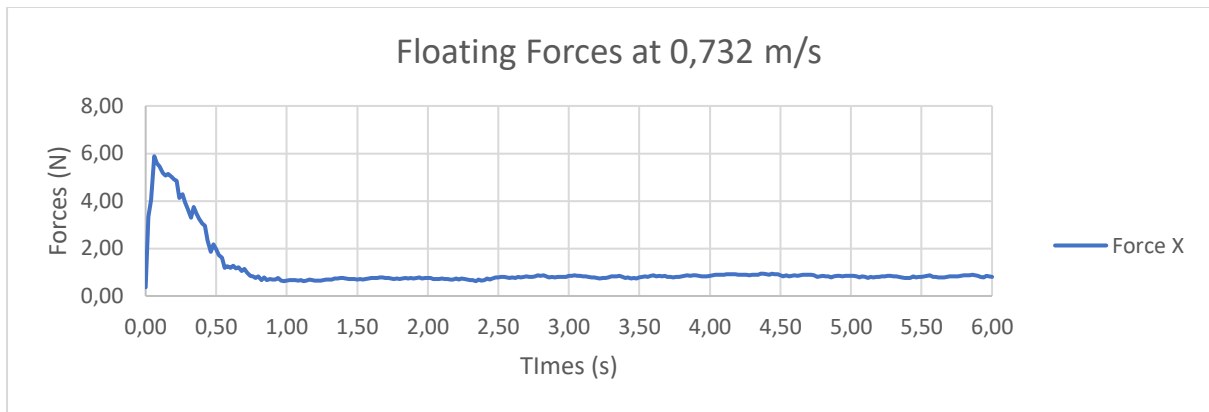
51	1,02	0,673	-0,076	22,429	22,433
52	1,04	0,658	0,233	26,072	26,076
53	1,06	0,667	0,205	23,143	23,148
54	1,08	0,648	-0,090	23,226	23,230
55	1,10	0,668	-0,391	26,265	26,271
56	1,12	0,627	-0,173	22,908	22,912
57	1,14	0,656	-0,346	24,088	24,094
58	1,16	0,691	-0,512	25,661	25,668
59	1,18	0,659	-0,670	22,671	22,681
60	1,20	0,652	-0,592	24,661	24,669
61	1,22	0,648	-0,778	25,149	25,160
62	1,24	0,640	-1,104	23,141	23,160
63	1,26	0,676	-0,846	25,329	25,341
64	1,28	0,682	-1,015	24,552	24,568
65	1,30	0,685	-1,134	22,919	22,940
66	1,32	0,683	-0,749	25,502	25,512
67	1,34	0,733	-1,249	24,158	24,182
68	1,36	0,730	-1,239	23,537	23,561
69	1,38	0,747	-0,867	25,755	25,769
70	1,40	0,754	-1,200	23,611	23,634
71	1,42	0,742	-1,074	24,310	24,329
72	1,44	0,720	-1,167	25,513	25,532
73	1,46	0,722	-1,226	23,850	23,872
74	1,48	0,710	-1,290	24,898	24,921
75	1,50	0,684	-1,212	25,313	25,334
76	1,52	0,719	-1,400	23,566	23,594
77	1,54	0,699	-1,302	25,386	25,409
78	1,56	0,714	-1,554	25,288	25,320
79	1,58	0,738	-1,552	23,838	23,872
80	1,60	0,753	-1,376	25,432	25,459
81	1,62	0,767	-1,147	24,658	24,678
82	1,64	0,754	-1,257	23,878	23,902
83	1,66	0,777	-1,223	25,581	25,603
84	1,68	0,776	-1,127	24,294	24,314
85	1,70	0,762	-1,094	24,425	24,445
86	1,72	0,768	-0,998	25,337	25,354
87	1,74	0,731	-0,884	23,912	23,927
88	1,76	0,722	-1,075	24,588	24,606
89	1,78	0,725	-0,962	25,168	25,184
90	1,80	0,715	-1,241	23,765	23,788
91	1,82	0,726	-0,956	24,734	24,749
92	1,84	0,758	-1,307	24,963	24,988
93	1,86	0,728	-1,089	23,966	23,985
94	1,88	0,763	-0,838	25,127	25,140
95	1,90	0,744	-0,952	24,648	24,664
96	1,92	0,747	-1,055	23,945	23,964
97	1,94	0,769	-0,884	25,109	25,123
98	1,96	0,728	-0,712	24,348	24,359
99	1,98	0,751	-0,810	24,316	24,329
100	2,00	0,757	-0,672	25,209	25,219

101	2,02	0,747	-0,765	23,910	23,922
102	2,04	0,703	-0,535	24,302	24,310
103	2,06	0,705	-0,535	25,084	25,092
104	2,08	0,720	-0,680	24,005	24,016
105	2,10	0,731	-0,782	24,736	24,748
106	2,12	0,701	-0,899	24,760	24,774
107	2,14	0,707	-0,705	24,036	24,047
108	2,16	0,694	-0,911	24,941	24,955
109	2,18	0,694	-0,669	24,681	24,691
110	2,20	0,725	-0,766	24,359	24,371
111	2,22	0,700	-0,657	25,095	25,105
112	2,24	0,726	-0,457	24,751	24,759
113	2,26	0,723	-0,637	24,503	24,512
114	2,28	0,684	-0,505	25,251	25,258
115	2,30	0,667	-0,575	24,557	24,565
116	2,32	0,676	-0,667	24,537	24,547
117	2,34	0,628	-0,773	25,103	25,113
118	2,36	0,680	-0,937	24,239	24,254
119	2,38	0,656	-0,857	24,801	24,813
120	2,40	0,672	-1,147	24,899	24,918
121	2,42	0,725	-1,102	24,116	24,135
122	2,44	0,701	-0,994	24,751	24,766
123	2,46	0,745	-1,272	24,913	24,936
124	2,48	0,769	-1,015	24,329	24,346
125	2,50	0,782	-1,052	25,073	25,091
126	2,52	0,813	-1,139	24,923	24,944
127	2,54	0,808	-0,834	24,424	24,438
128	2,56	0,788	-0,797	25,138	25,151
129	2,58	0,755	-1,079	24,654	24,673
130	2,60	0,785	-1,020	24,466	24,484
131	2,62	0,756	-1,006	25,068	25,085
132	2,64	0,792	-1,205	24,550	24,572
133	2,66	0,782	-1,444	24,553	24,583
134	2,68	0,807	-1,482	24,779	24,810
135	2,70	0,833	-1,462	24,284	24,316
136	2,72	0,795	-1,244	24,577	24,601
137	2,74	0,803	-1,071	24,819	24,838
138	2,76	0,828	-1,199	24,237	24,261
139	2,78	0,874	-0,797	24,589	24,604
140	2,80	0,846	-0,964	24,743	24,760
141	2,82	0,867	-0,787	24,181	24,196
142	2,84	0,819	-1,088	24,927	24,946
143	2,86	0,788	-0,928	24,690	24,706
144	2,88	0,804	-1,405	24,657	24,686
145	2,90	0,786	-1,169	24,668	24,690
146	2,92	0,813	-1,190	24,695	24,717
147	2,94	0,803	-1,478	24,693	24,724
148	2,96	0,811	-1,598	24,891	24,926
149	2,98	0,795	-1,433	24,457	24,487
150	3,00	0,843	-1,421	24,751	24,780

151	3,02	0,837	-1,232	24,977	25,001
152	3,04	0,878	-1,145	24,575	24,597
153	3,06	0,851	-1,130	24,953	24,975
154	3,08	0,857	-0,799	24,640	24,654
155	3,10	0,832	-1,132	24,612	24,634
156	3,12	0,815	-0,677	24,818	24,829
157	3,14	0,801	-0,784	24,720	24,733
158	3,16	0,780	-1,207	24,537	24,560
159	3,18	0,772	-1,104	24,657	24,677
160	3,20	0,749	-1,329	24,513	24,539
161	3,22	0,732	-1,258	24,628	24,652
162	3,24	0,747	-1,348	24,955	24,980
163	3,26	0,763	-1,376	24,567	24,594
164	3,28	0,783	-1,394	24,807	24,835
165	3,30	0,816	-1,158	24,887	24,909
166	3,32	0,816	-1,157	24,783	24,804
167	3,34	0,833	-0,914	24,954	24,970
168	3,36	0,836	-0,582	24,920	24,931
169	3,38	0,792	-0,658	24,679	24,690
170	3,40	0,765	-0,757	24,737	24,749
171	3,42	0,786	-0,666	24,596	24,607
172	3,44	0,739	-0,789	24,671	24,683
173	3,46	0,765	-1,139	24,973	24,993
174	3,48	0,746	-1,023	24,776	24,793
175	3,50	0,786	-1,083	24,887	24,906
176	3,52	0,811	-1,253	24,904	24,928
177	3,54	0,816	-1,000	24,903	24,920
178	3,56	0,812	-1,009	24,887	24,905
179	3,58	0,842	-1,120	24,889	24,910
180	3,60	0,869	-0,954	24,537	24,555
181	3,62	0,825	-1,224	25,068	25,091
182	3,64	0,846	-0,931	25,069	25,085
183	3,66	0,817	-1,238	24,882	24,906
184	3,68	0,851	-1,054	25,024	25,043
185	3,70	0,813	-1,178	25,010	25,032
186	3,72	0,804	-1,336	24,968	24,994
187	3,74	0,782	-1,448	25,033	25,062
188	3,76	0,807	-1,440	24,889	24,918
189	3,78	0,808	-1,358	24,856	24,883
190	3,80	0,826	-1,335	25,036	25,063
191	3,82	0,857	-1,062	24,719	24,739
192	3,84	0,867	-1,459	24,821	24,852
193	3,86	0,857	-1,266	25,118	25,143
194	3,88	0,879	-1,344	24,756	24,784
195	3,90	0,861	-1,090	24,706	24,727
196	3,92	0,851	-1,127	24,766	24,788
197	3,94	0,817	-1,239	24,788	24,812
198	3,96	0,832	-1,138	24,841	24,863
199	3,98	0,833	-1,242	24,801	24,825
200	4,00	0,856	-1,063	24,562	24,582

201	4,02	0,869	-1,438	24,980	25,011
202	4,04	0,893	-1,349	24,791	24,819
203	4,06	0,883	-1,341	24,695	24,723
204	4,08	0,903	-1,096	24,696	24,718
205	4,10	0,889	-1,394	24,697	24,727
206	4,12	0,923	-1,210	24,503	24,528
207	4,14	0,925	-1,363	24,801	24,830
208	4,16	0,911	-1,219	24,563	24,588
209	4,18	0,908	-1,210	24,710	24,734
210	4,20	0,886	-0,857	24,793	24,808
211	4,22	0,894	-1,203	24,456	24,481
212	4,24	0,883	-1,079	24,596	24,617
213	4,26	0,895	-1,025	24,717	24,737
214	4,28	0,870	-1,641	24,740	24,778
215	4,30	0,882	-1,124	24,595	24,617
216	4,32	0,891	-1,284	24,764	24,790
217	4,34	0,903	-1,416	24,582	24,612
218	4,36	0,931	-0,995	24,665	24,685
219	4,38	0,936	-1,443	24,506	24,538
220	4,40	0,917	-1,244	24,311	24,337
221	4,42	0,899	-1,223	24,725	24,749
222	4,44	0,927	-1,190	24,465	24,490
223	4,46	0,917	-1,298	24,456	24,483
224	4,48	0,904	-1,328	24,408	24,436
225	4,50	0,869	-1,386	24,462	24,492
226	4,52	0,829	-1,375	24,646	24,675
227	4,54	0,863	-1,541	24,608	24,643
228	4,56	0,826	-1,317	24,507	24,534
229	4,58	0,852	-1,319	24,647	24,674
230	4,60	0,876	-1,305	24,623	24,650
231	4,62	0,850	-1,272	24,488	24,514
232	4,64	0,876	-1,231	24,422	24,447
233	4,66	0,886	-1,334	24,367	24,395
234	4,68	0,890	-1,390	24,381	24,411
235	4,70	0,897	-1,578	24,297	24,334
236	4,72	0,898	-1,271	24,327	24,353
237	4,74	0,863	-1,232	24,223	24,248
238	4,76	0,809	-1,201	24,536	24,558
239	4,78	0,831	-1,227	24,398	24,422
240	4,80	0,842	-1,235	24,371	24,396
241	4,82	0,832	-1,368	24,624	24,652
242	4,84	0,814	-1,414	24,373	24,403
243	4,86	0,791	-1,348	24,678	24,705
244	4,88	0,832	-1,500	24,720	24,752
245	4,90	0,855	-1,466	24,265	24,297
246	4,92	0,854	-1,225	24,523	24,547
247	4,94	0,834	-1,447	24,577	24,607
248	4,96	0,842	-1,406	24,568	24,597
249	4,98	0,842	-1,458	24,508	24,539
250	5,00	0,840	-1,360	24,357	24,385

251	5,02	0,851	-1,294	24,538	24,564
252	5,04	0,821	-1,439	24,336	24,367
253	5,06	0,790	-1,399	24,521	24,549
254	5,08	0,831	-1,546	24,331	24,365
255	5,10	0,792	-1,321	24,640	24,666
256	5,12	0,764	-1,366	24,591	24,618
257	5,14	0,807	-1,345	24,676	24,703
258	5,16	0,778	-1,487	24,576	24,607
259	5,18	0,798	-1,483	24,690	24,721
260	5,20	0,796	-1,170	24,591	24,613
261	5,22	0,814	-1,571	24,783	24,817
262	5,24	0,831	-1,259	24,516	24,540
263	5,26	0,839	-1,450	24,386	24,417
264	5,28	0,839	-1,361	24,568	24,596
265	5,30	0,825	-1,544	24,400	24,434
266	5,32	0,817	-1,600	24,692	24,727
267	5,34	0,792	-1,198	24,377	24,400
268	5,36	0,777	-1,339	24,522	24,549
269	5,38	0,754	-1,514	24,542	24,573
270	5,40	0,767	-1,675	24,613	24,651
271	5,42	0,763	-1,625	24,676	24,711
272	5,44	0,827	-1,769	24,605	24,648
273	5,46	0,781	-1,276	24,572	24,597
274	5,48	0,803	-1,577	24,646	24,681
275	5,50	0,803	-1,388	24,646	24,674
276	5,52	0,830	-1,417	24,651	24,681
277	5,54	0,844	-1,345	24,665	24,692
278	5,56	0,874	-1,294	24,485	24,512
279	5,58	0,809	-1,216	24,507	24,530
280	5,60	0,806	-1,268	24,609	24,634
281	5,62	0,774	-1,383	24,480	24,508
282	5,64	0,781	-1,267	24,558	24,583
283	5,66	0,790	-1,354	24,676	24,703
284	5,68	0,803	-1,437	24,439	24,468
285	5,70	0,823	-1,579	24,609	24,644
286	5,72	0,814	-1,513	24,695	24,727
287	5,74	0,831	-1,714	24,706	24,746
288	5,76	0,820	-1,439	24,816	24,846
289	5,78	0,840	-1,399	24,711	24,740
290	5,80	0,863	-1,300	24,442	24,469
291	5,82	0,865	-1,376	24,594	24,623
292	5,84	0,870	-1,308	24,579	24,606
293	5,86	0,882	-1,441	24,616	24,647
294	5,88	0,880	-1,337	24,577	24,605
295	5,90	0,854	-1,424	24,490	24,521
296	5,92	0,804	-1,570	24,582	24,617
297	5,94	0,786	-1,406	24,665	24,693
298	5,96	0,843	-1,680	24,560	24,599
299	5,98	0,823	-1,274	24,510	24,535
300	6,00	0,797	-1,619	24,663	24,699



Berdasarkan grafik diatas, nilai tahanan model kapal menggunakan *bulbous bow* terjadi pada waktu 4,5 – 5,0 s. Sehingga apabila dirata – ratakan nilai tahanan model kapal 1,699 N.

- Kecepatan 0,813 m/s

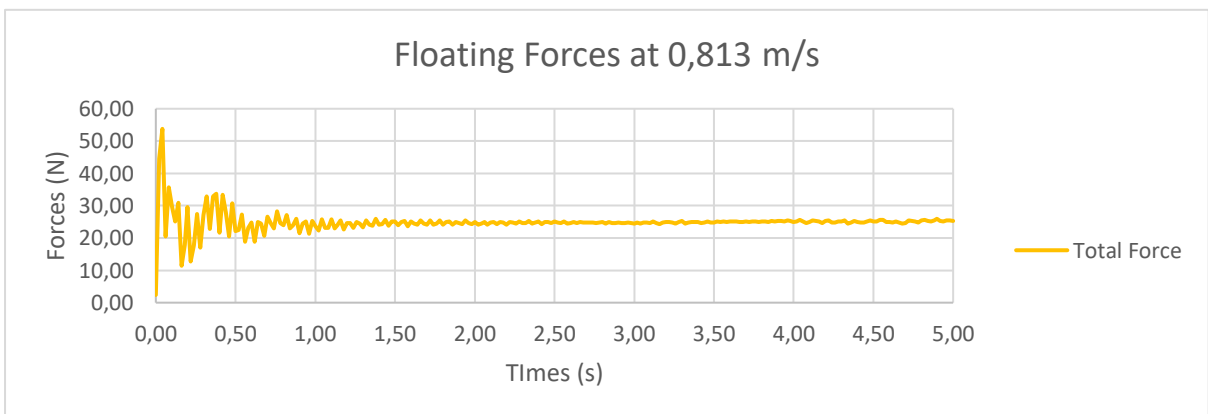
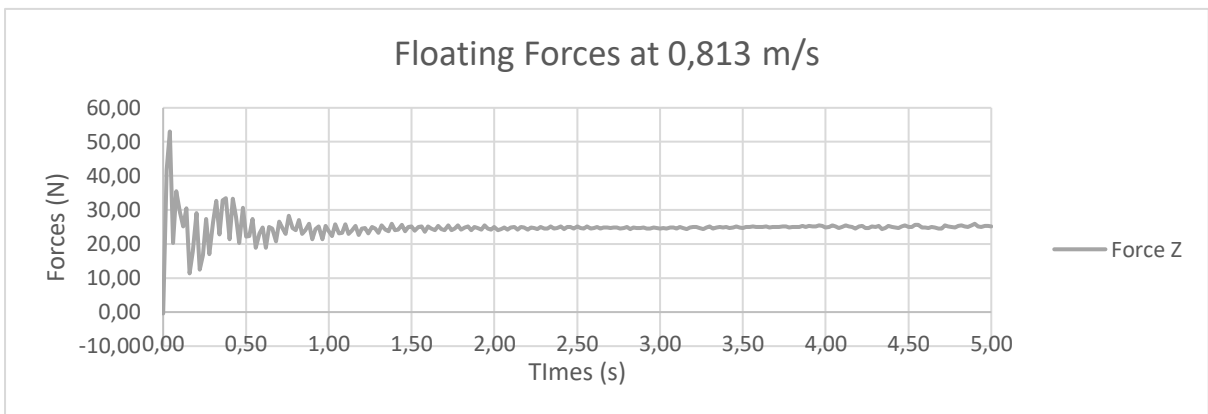
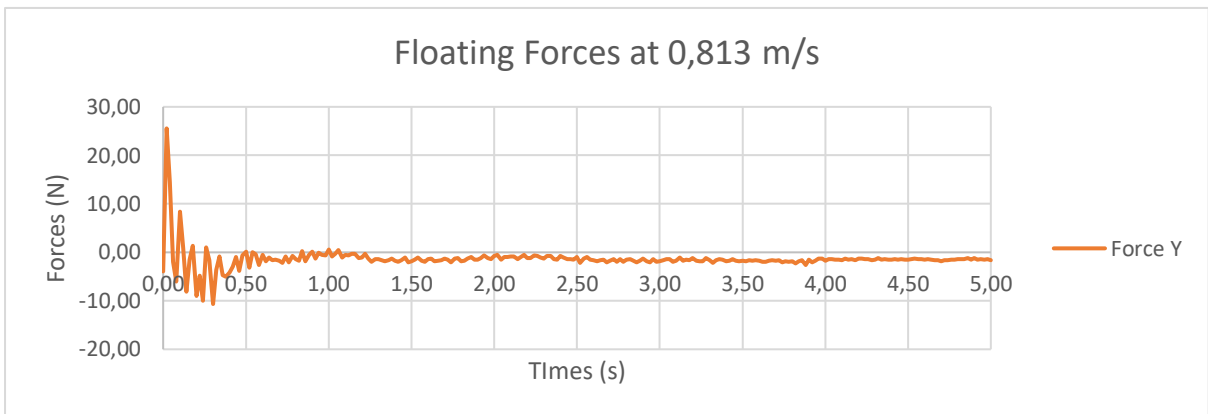
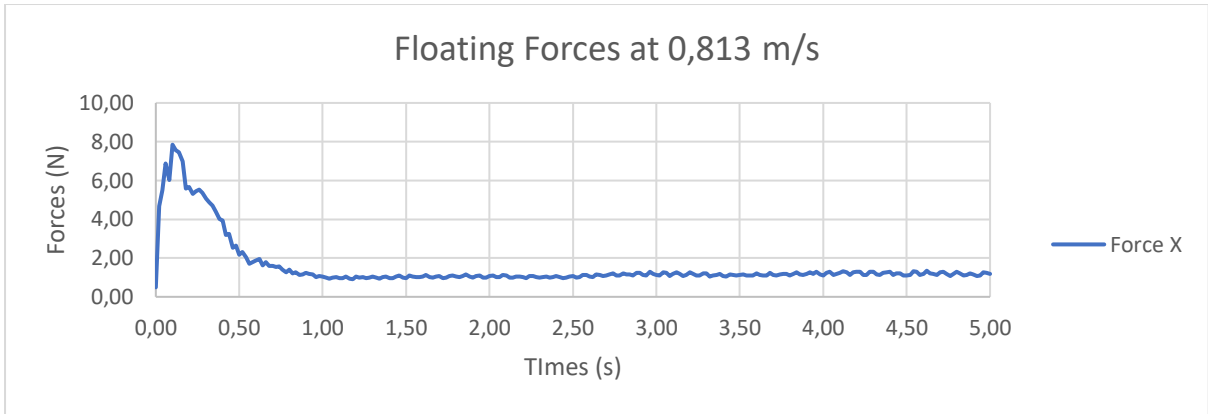
Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
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1	0,02	4,681	25,557	41,769	44,517
2	0,04	5,497	14,467	53,039	53,779
3	0,06	6,868	-1,920	20,363	20,442
4	0,08	6,027	-6,004	35,483	35,676
5	0,10	7,846	8,365	29,230	29,699
6	0,12	7,559	0,899	25,115	25,140
7	0,14	7,448	-8,092	30,499	30,898
8	0,16	6,980	-1,566	11,368	11,433
9	0,18	5,573	1,347	17,846	17,882
10	0,20	5,678	-8,962	29,037	29,553
11	0,22	5,313	-4,761	12,422	12,771
12	0,24	5,441	-9,947	16,621	17,672
13	0,26	5,541	1,024	27,356	27,381
14	0,28	5,368	-1,584	16,959	17,010
15	0,30	5,059	-10,661	26,333	27,104
16	0,32	4,881	-3,562	32,739	32,813
17	0,34	4,695	-0,901	22,791	22,820
18	0,36	4,413	-4,656	32,789	32,923
19	0,38	4,013	-5,014	33,471	33,619
20	0,40	3,924	-4,175	21,470	21,630
21	0,42	3,182	-2,903	33,236	33,295
22	0,44	3,239	-0,946	27,942	27,964
23	0,46	2,535	-3,844	20,300	20,444
24	0,48	2,630	-0,633	30,669	30,682
25	0,50	2,176	0,133	22,187	22,197
26	0,52	2,310	-3,149	22,384	22,474
27	0,54	2,034	0,064	27,284	27,291
28	0,56	1,697	-0,461	18,916	18,925
29	0,58	1,797	-2,665	23,118	23,180
30	0,60	1,859	-0,568	24,803	24,812
31	0,62	1,955	-1,795	18,884	18,923
32	0,64	1,614	-1,083	24,965	24,982
33	0,66	1,777	-1,673	24,491	24,522
34	0,68	1,608	-1,485	20,702	20,731
35	0,70	1,582	-1,768	26,532	26,561
36	0,72	1,526	-2,163	24,619	24,661
37	0,74	1,568	-0,893	22,944	22,960
38	0,76	1,395	-2,077	28,273	28,307
39	0,78	1,267	-0,764	24,663	24,673
40	0,80	1,400	-1,396	24,018	24,041
41	0,82	1,222	-1,685	27,076	27,102
42	0,84	1,264	0,266	22,885	22,894
43	0,86	1,121	-1,879	23,993	24,026
44	0,88	1,158	-0,472	25,926	25,934
45	0,90	1,247	0,133	21,452	21,462
46	0,92	1,180	-1,282	24,409	24,428
47	0,94	1,149	-0,086	25,098	25,105
48	0,96	1,014	-0,487	21,358	21,367
49	0,98	1,069	-0,593	25,277	25,287
50	1,00	1,033	0,551	23,692	23,701

51	1,02	0,984	-0,808	22,340	22,352
52	1,04	0,946	-0,281	25,785	25,791
53	1,06	0,992	0,430	23,103	23,112
54	1,08	1,028	-1,059	23,197	23,213
55	1,10	0,961	-0,501	25,710	25,718
56	1,12	0,961	-0,616	23,009	23,018
57	1,14	1,041	-0,310	23,898	23,906
58	1,16	0,945	-0,262	25,360	25,366
59	1,18	0,915	-1,153	22,642	22,659
60	1,20	1,034	-1,046	24,530	24,546
61	1,22	0,991	-0,326	24,659	24,666
62	1,24	1,014	-1,306	23,121	23,142
63	1,26	0,963	-1,959	25,002	25,035
64	1,28	0,993	-1,451	24,516	24,539
65	1,30	1,055	-1,377	23,260	23,282
66	1,32	0,998	-1,658	25,410	25,436
67	1,34	0,928	-1,898	24,141	24,174
68	1,36	1,025	-1,671	23,695	23,724
69	1,38	1,047	-1,266	26,007	26,025
70	1,40	0,968	-1,749	24,135	24,164
71	1,42	0,957	-1,936	24,237	24,271
72	1,44	1,043	-1,602	25,641	25,666
73	1,46	1,087	-1,050	23,750	23,767
74	1,48	0,977	-2,085	25,036	25,074
75	1,50	0,971	-1,804	25,089	25,118
76	1,52	1,096	-1,473	23,878	23,903
77	1,54	1,054	-1,128	24,932	24,948
78	1,56	1,009	-1,729	25,210	25,238
79	1,58	1,009	-1,910	23,536	23,571
80	1,60	1,043	-1,393	25,140	25,162
81	1,62	1,126	-1,289	24,500	24,521
82	1,64	1,021	-1,852	24,027	24,060
83	1,66	0,995	-1,700	25,377	25,404
84	1,68	1,049	-1,629	24,363	24,390
85	1,70	1,076	-1,325	24,130	24,152
86	1,72	0,970	-1,519	25,447	25,469
87	1,74	0,981	-2,070	24,063	24,102
88	1,76	1,071	-1,256	24,481	24,500
89	1,78	1,107	-1,191	25,468	25,486
90	1,80	1,039	-1,894	24,167	24,201
91	1,82	1,006	-1,786	24,845	24,875
92	1,84	1,082	-1,267	25,096	25,116
93	1,86	1,158	-0,996	24,090	24,106
94	1,88	1,043	-1,492	24,964	24,987
95	1,90	0,994	-1,532	24,672	24,696
96	1,92	1,086	-1,165	24,267	24,285
97	1,94	1,097	-0,659	25,393	25,404
98	1,96	0,978	-1,136	24,540	24,556
99	1,98	0,990	-1,386	24,201	24,222
100	2,00	1,069	-0,749	24,943	24,955

101	2,02	1,099	-0,536	24,094	24,104
102	2,04	1,013	-1,495	24,448	24,471
103	2,06	1,024	-0,942	24,859	24,873
104	2,08	1,117	-0,915	24,196	24,211
105	2,10	1,088	-0,804	24,834	24,846
106	2,12	0,987	-0,840	24,962	24,974
107	2,14	0,983	-1,372	24,235	24,255
108	2,16	1,042	-0,984	24,938	24,952
109	2,18	1,056	-0,504	24,838	24,848
110	2,20	1,030	-1,193	24,169	24,187
111	2,22	0,962	-1,156	24,912	24,928
112	2,24	1,061	-0,611	24,762	24,772
113	2,26	1,080	-0,765	24,420	24,432
114	2,28	1,019	-1,097	25,049	25,064
115	2,30	0,996	-1,252	24,550	24,568
116	2,32	1,020	-0,796	24,587	24,599
117	2,34	1,039	-0,726	25,211	25,221
118	2,36	1,000	-1,393	24,499	24,520
119	2,38	1,006	-1,486	24,757	24,780
120	2,40	1,075	-0,708	25,132	25,143
121	2,42	1,021	-1,073	24,327	24,342
122	2,44	0,974	-1,411	24,941	24,962
123	2,46	0,988	-1,378	24,961	24,981
124	2,48	1,050	-1,483	24,572	24,595
125	2,50	1,073	-0,916	25,106	25,120
126	2,52	0,995	-2,179	24,733	24,774
127	2,54	1,009	-1,260	24,529	24,547
128	2,56	1,129	-1,005	25,078	25,093
129	2,58	1,128	-1,497	24,500	24,525
130	2,60	1,049	-1,668	24,620	24,648
131	2,62	1,027	-1,891	24,970	25,003
132	2,64	1,159	-1,630	24,602	24,631
133	2,66	1,129	-1,462	24,885	24,909
134	2,68	1,076	-2,034	24,799	24,836
135	2,70	1,107	-1,756	24,727	24,758
136	2,72	1,156	-1,350	24,844	24,866
137	2,74	1,203	-1,911	24,834	24,870
138	2,76	1,107	-1,370	24,585	24,607
139	2,78	1,103	-1,928	24,710	24,745
140	2,80	1,197	-1,534	24,961	24,988
141	2,82	1,157	-1,457	24,372	24,397
142	2,84	1,158	-1,778	24,868	24,900
143	2,86	1,110	-2,035	24,651	24,689
144	2,88	1,243	-1,693	24,657	24,688
145	2,90	1,236	-1,294	24,844	24,867
146	2,92	1,136	-1,848	24,524	24,557
147	2,94	1,112	-2,077	24,606	24,645
148	2,96	1,288	-1,363	24,814	24,838
149	2,98	1,188	-1,978	24,662	24,700
150	3,00	1,127	-1,864	24,450	24,484

150	3,00	1,127	-1,864	24,450	24,484
151	3,02	1,089	-1,672	24,694	24,722
152	3,04	1,276	-1,435	24,455	24,481
153	3,06	1,236	-1,408	24,803	24,828
154	3,08	1,067	-2,007	24,763	24,800
155	3,10	1,183	-1,768	24,578	24,610
156	3,12	1,268	-1,056	25,036	25,055
157	3,14	1,174	-1,751	24,629	24,661
158	3,16	1,084	-1,559	24,313	24,339
159	3,18	1,128	-1,650	24,833	24,861
160	3,20	1,253	-1,185	25,007	25,028
161	3,22	1,190	-1,770	24,961	24,993
162	3,24	1,087	-1,899	24,705	24,739
163	3,26	1,092	-1,860	24,356	24,390
164	3,28	1,217	-1,208	24,895	24,916
165	3,30	1,209	-1,646	25,219	25,247
166	3,32	1,054	-2,190	24,494	24,537
167	3,34	1,086	-1,665	24,821	24,849
168	3,36	1,130	-1,381	24,961	24,983
169	3,38	1,176	-1,472	24,900	24,925
170	3,40	1,072	-1,819	24,948	24,980
171	3,42	1,054	-1,692	24,644	24,673
172	3,44	1,151	-1,390	24,781	24,803
173	3,46	1,129	-1,774	25,126	25,157
174	3,48	1,102	-1,820	24,838	24,870
175	3,50	1,118	-1,680	24,739	24,768
176	3,52	1,147	-1,885	25,015	25,049
177	3,54	1,105	-1,672	24,938	24,966
178	3,56	1,102	-1,764	25,080	25,111
179	3,58	1,104	-1,646	25,000	25,027
180	3,60	1,211	-1,789	25,009	25,042
181	3,62	1,134	-1,902	25,004	25,038
182	3,64	1,105	-1,979	25,089	25,125
183	3,66	1,107	-1,683	24,880	24,908
184	3,68	1,234	-1,622	25,002	25,031
185	3,70	1,132	-1,741	25,072	25,102
186	3,72	1,113	-1,630	24,947	24,974
187	3,74	1,168	-2,101	25,146	25,187
188	3,76	1,189	-1,806	25,116	25,149
189	3,78	1,180	-1,988	24,893	24,931
190	3,80	1,099	-1,890	25,028	25,062
191	3,82	1,170	-2,338	25,071	25,119
192	3,84	1,265	-1,871	24,939	24,975
193	3,86	1,162	-1,670	25,261	25,290
194	3,88	1,131	-2,560	25,014	25,069
195	3,90	1,175	-1,525	25,326	25,351
196	3,92	1,265	-2,091	25,176	25,218
197	3,94	1,190	-1,747	25,163	25,194
198	3,96	1,280	-1,306	25,440	25,488
199	3,98	1,159	-1,271	25,287	25,329
200	4,00	1,105	-1,719	24,850	24,912

201	4,02	1,236	-1,454	25,006	25,059
202	4,04	1,293	-1,375	25,498	25,549
203	4,06	1,140	-1,558	25,106	25,161
204	4,08	1,170	-1,490	24,612	24,665
205	4,10	1,229	-1,637	24,954	25,016
206	4,12	1,310	-1,295	25,444	25,492
207	4,14	1,252	-1,464	25,176	25,229
208	4,16	1,115	-1,457	25,023	25,072
209	4,18	1,267	-1,675	24,582	24,648
210	4,20	1,282	-1,347	25,170	25,220
211	4,22	1,287	-1,290	25,365	25,412
212	4,24	1,134	-1,446	24,714	24,764
213	4,26	1,133	-1,418	24,727	24,776
214	4,28	1,291	-1,662	25,121	25,186
215	4,30	1,279	-1,494	25,065	25,121
216	4,32	1,163	-1,172	25,387	25,426
217	4,34	1,140	-1,469	24,383	24,435
218	4,36	1,239	-1,436	24,739	24,791
219	4,38	1,278	-1,461	25,261	25,315
220	4,40	1,284	-1,552	24,931	24,991
221	4,42	1,120	-1,450	24,779	24,828
222	4,44	1,213	-1,522	24,663	24,719
223	4,46	1,218	-1,385	25,116	25,165
224	4,48	1,091	-1,464	25,409	25,457
225	4,50	1,095	-1,507	25,030	25,081
226	4,52	1,114	-1,382	25,022	25,068
227	4,54	1,325	-1,332	25,592	25,641
228	4,56	1,300	-1,408	25,550	25,602
229	4,58	1,139	-1,458	24,889	24,940
230	4,60	1,178	-1,550	24,838	24,894
231	4,62	1,335	-1,398	24,663	24,718
232	4,64	1,215	-1,568	25,065	25,122
233	4,66	1,171	-1,609	24,804	24,863
234	4,68	1,135	-1,663	24,471	24,532
235	4,70	1,266	-1,838	24,558	24,633
236	4,72	1,305	-1,571	25,418	25,478
237	4,74	1,175	-1,645	25,187	25,247
238	4,76	1,071	-1,476	25,059	25,108
239	4,78	1,179	-1,562	24,774	24,831
240	4,80	1,294	-1,396	25,375	25,426
241	4,82	1,212	-1,354	25,491	25,538
242	4,84	1,095	-1,454	25,225	25,273
243	4,86	1,119	-1,230	25,025	25,065
244	4,88	1,207	-1,545	25,451	25,506
245	4,90	1,157	-1,162	25,864	25,901
246	4,92	1,077	-1,545	25,170	25,221
247	4,94	1,103	-1,412	24,991	25,038
248	4,96	1,264	-1,544	25,359	25,416
249	4,98	1,231	-1,391	25,351	25,401
250	5,00	1,183	-1,616	25,173	25,231



Berdasarkan grafik diatas, nilai tahanan model kapal menggunakan *bulbous bow* terjadi pada waktu 2,0 – 2,5 s. Sehingga apabila dirata – ratakan nilai tahanan model kapal 2,067 N.

- Kecepatan 0,894 m/s

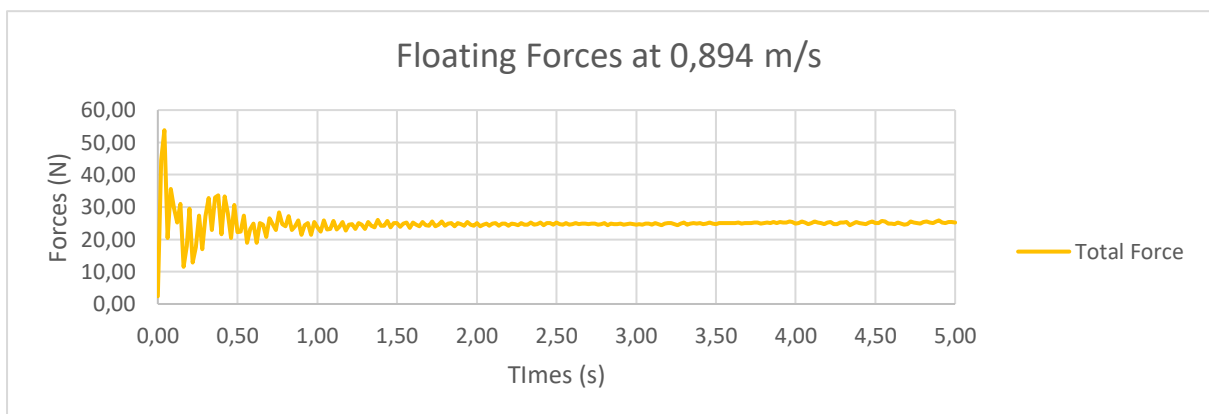
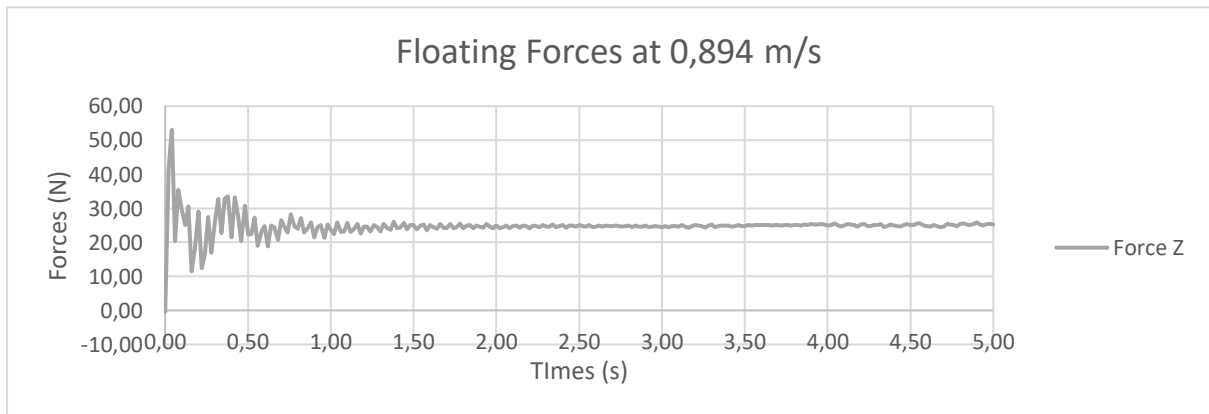
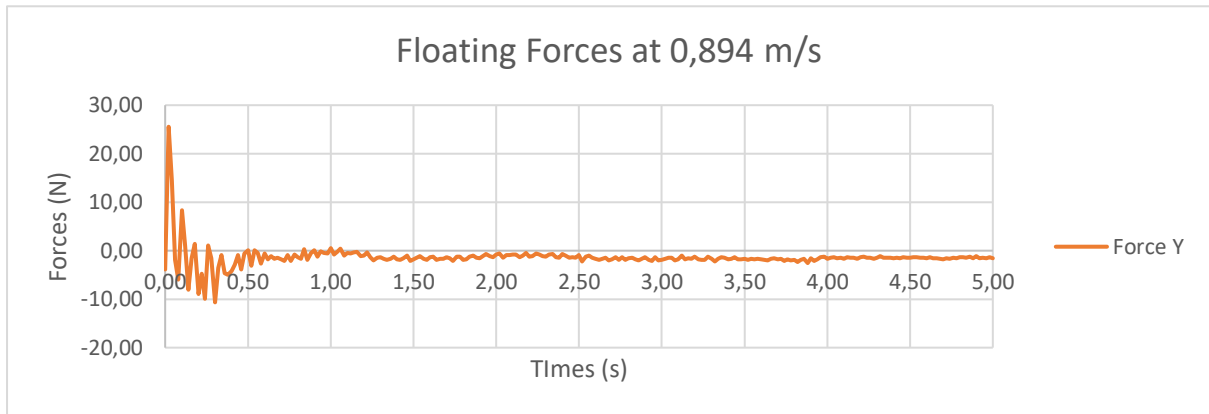
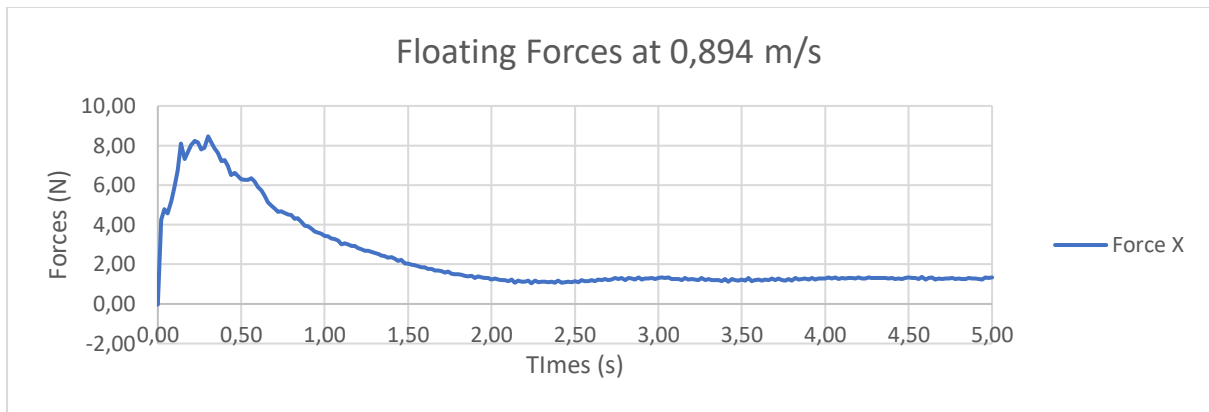
Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	-0,031	-3,925	-0,412	2,395
1	0,02	4,261	25,557	41,769	44,517
2	0,04	4,779	14,467	53,039	53,779
3	0,06	4,575	-1,920	20,363	20,442
4	0,08	5,181	-6,004	35,483	35,676
5	0,10	5,922	8,365	29,230	29,699
6	0,12	6,752	0,899	25,115	25,140
7	0,14	8,100	-8,092	30,499	30,898
8	0,16	7,305	-1,566	11,368	11,433
9	0,18	7,658	1,347	17,846	17,882
10	0,20	8,006	-8,962	29,037	29,553
11	0,22	8,231	-4,761	12,422	12,771
12	0,24	8,154	-9,947	16,621	17,672
13	0,26	7,811	1,024	27,356	27,381
14	0,28	7,892	-1,584	16,959	17,010
15	0,30	8,463	-10,661	26,333	27,104
16	0,32	8,144	-3,562	32,739	32,813
17	0,34	7,864	-0,901	22,791	22,820
18	0,36	7,634	-4,656	32,789	32,923
19	0,38	7,212	-5,014	33,471	33,619
20	0,40	7,261	-4,175	21,470	21,630
21	0,42	6,962	-2,903	33,236	33,295
22	0,44	6,511	-0,946	27,942	27,964
23	0,46	6,618	-3,844	20,300	20,444
24	0,48	6,445	-0,633	30,669	30,682
25	0,50	6,306	0,133	22,187	22,197
26	0,52	6,275	-3,149	22,384	22,474
27	0,54	6,267	0,064	27,284	27,291
28	0,56	6,360	-0,461	18,916	18,925
29	0,58	6,188	-2,665	23,118	23,180
30	0,60	5,905	-0,568	24,803	24,812
31	0,62	5,730	-1,795	18,884	18,923
32	0,64	5,458	-1,083	24,965	24,982
33	0,66	5,139	-1,673	24,491	24,522
34	0,68	4,980	-1,485	20,702	20,731
35	0,70	4,812	-1,768	26,532	26,561
36	0,72	4,644	-2,163	24,619	24,661
37	0,74	4,667	-0,893	22,944	22,960
38	0,76	4,596	-2,077	28,273	28,307
39	0,78	4,516	-0,764	24,663	24,673
40	0,80	4,501	-1,396	24,018	24,041
41	0,82	4,315	-1,685	27,076	27,102
42	0,84	4,326	0,266	22,885	22,894
43	0,86	4,133	-1,879	23,993	24,026
44	0,88	3,960	-0,472	25,926	25,934
45	0,90	3,935	0,133	21,452	21,462
46	0,92	3,820	-1,282	24,409	24,428
47	0,94	3,656	-0,086	25,098	25,105
48	0,96	3,605	-0,487	21,358	21,367
49	0,98	3,545	-0,593	25,277	25,287
50	1,00	3,449	0,551	23,692	23,701

51	1,02	3,405	-0,808	22,340	22,352
52	1,04	3,313	-0,281	25,785	25,791
53	1,06	3,277	0,430	23,103	23,112
54	1,08	3,195	-1,059	23,197	23,213
55	1,10	3,018	-0,501	25,710	25,718
56	1,12	3,063	-0,616	23,009	23,018
57	1,14	3,021	-0,310	23,898	23,906
58	1,16	2,933	-0,262	25,360	25,366
59	1,18	2,932	-1,153	22,642	22,659
60	1,20	2,826	-1,046	24,530	24,546
61	1,22	2,768	-0,326	24,659	24,666
62	1,24	2,685	-1,306	23,121	23,142
63	1,26	2,695	-1,959	25,002	25,035
64	1,28	2,623	-1,451	24,516	24,539
65	1,30	2,591	-1,377	23,260	23,282
66	1,32	2,519	-1,658	25,410	25,436
67	1,34	2,430	-1,898	24,141	24,174
68	1,36	2,421	-1,671	23,695	23,724
69	1,38	2,329	-1,266	26,007	26,025
70	1,40	2,374	-1,749	24,135	24,164
71	1,42	2,291	-1,936	24,237	24,271
72	1,44	2,186	-1,602	25,641	25,666
73	1,46	2,226	-1,050	23,750	23,767
74	1,48	2,048	-2,085	25,036	25,074
75	1,50	2,047	-1,804	25,089	25,118
76	1,52	1,985	-1,473	23,878	23,903
77	1,54	1,969	-1,128	24,932	24,948
78	1,56	1,918	-1,729	25,210	25,238
79	1,58	1,846	-1,910	23,536	23,571
80	1,60	1,851	-1,393	25,140	25,162
81	1,62	1,760	-1,289	24,500	24,521
82	1,64	1,760	-1,852	24,027	24,060
83	1,66	1,678	-1,700	25,377	25,404
84	1,68	1,694	-1,629	24,363	24,390
85	1,70	1,658	-1,325	24,130	24,152
86	1,72	1,583	-1,519	25,447	25,469
87	1,74	1,648	-2,070	24,063	24,102
88	1,76	1,526	-1,256	24,481	24,500
89	1,78	1,506	-1,191	25,468	25,486
90	1,80	1,507	-1,894	24,167	24,201
91	1,82	1,462	-1,786	24,845	24,875
92	1,84	1,424	-1,267	25,096	25,116
93	1,86	1,385	-0,996	24,090	24,106
94	1,88	1,420	-1,492	24,964	24,987
95	1,90	1,321	-1,532	24,672	24,696
96	1,92	1,384	-1,165	24,267	24,285
97	1,94	1,339	-0,659	25,393	25,404
98	1,96	1,316	-1,136	24,540	24,556
99	1,98	1,325	-1,386	24,201	24,222
100	2,00	1,219	-0,749	24,943	24,955

101	2,02	1,277	-0,536	24,094	24,104
102	2,04	1,241	-1,495	24,448	24,471
103	2,06	1,211	-0,942	24,859	24,873
104	2,08	1,194	-0,915	24,196	24,211
105	2,10	1,151	-0,804	24,834	24,846
106	2,12	1,224	-0,840	24,962	24,974
107	2,14	1,078	-1,372	24,235	24,255
108	2,16	1,185	-0,984	24,938	24,952
109	2,18	1,122	-0,504	24,838	24,848
110	2,20	1,132	-1,193	24,169	24,187
111	2,22	1,168	-1,156	24,912	24,928
112	2,24	1,043	-0,611	24,762	24,772
113	2,26	1,173	-0,765	24,420	24,432
114	2,28	1,086	-1,097	25,049	25,064
115	2,30	1,126	-1,252	24,550	24,568
116	2,32	1,121	-0,796	24,587	24,599
117	2,34	1,088	-0,726	25,211	25,221
118	2,36	1,129	-1,393	24,499	24,520
119	2,38	1,078	-1,486	24,757	24,780
120	2,40	1,171	-0,708	25,132	25,143
121	2,42	1,069	-1,073	24,327	24,342
122	2,44	1,109	-1,411	24,941	24,962
123	2,46	1,116	-1,378	24,961	24,981
124	2,48	1,099	-1,483	24,572	24,595
125	2,50	1,163	-0,916	25,106	25,120
126	2,52	1,090	-2,179	24,733	24,774
127	2,54	1,194	-1,260	24,529	24,547
128	2,56	1,152	-1,005	25,078	25,093
129	2,58	1,163	-1,497	24,500	24,525
130	2,60	1,200	-1,668	24,620	24,648
131	2,62	1,145	-1,891	24,970	25,003
132	2,64	1,234	-1,630	24,602	24,631
133	2,66	1,206	-1,462	24,885	24,909
134	2,68	1,271	-2,034	24,799	24,836
135	2,70	1,195	-1,756	24,727	24,758
136	2,72	1,237	-1,350	24,844	24,866
137	2,74	1,306	-1,911	24,834	24,870
138	2,76	1,246	-1,370	24,585	24,607
139	2,78	1,313	-1,928	24,710	24,745
140	2,80	1,217	-1,534	24,961	24,988
141	2,82	1,304	-1,457	24,372	24,397
142	2,84	1,279	-1,778	24,868	24,900
143	2,86	1,241	-2,035	24,651	24,689
144	2,88	1,332	-1,693	24,657	24,688
145	2,90	1,232	-1,294	24,844	24,867
146	2,92	1,294	-1,848	24,524	24,557
147	2,94	1,291	-2,077	24,606	24,645
148	2,96	1,299	-1,363	24,814	24,838
149	2,98	1,264	-1,978	24,662	24,700
150	3,00	1,311	-1,864	24,450	24,484

151	3,02	1,337	-1,672	24,694	24,722
152	3,04	1,302	-1,435	24,455	24,481
153	3,06	1,343	-1,408	24,803	24,828
154	3,08	1,264	-2,007	24,763	24,800
155	3,10	1,262	-1,768	24,578	24,610
156	3,12	1,268	-1,056	25,036	25,055
157	3,14	1,213	-1,751	24,629	24,661
158	3,16	1,309	-1,559	24,313	24,339
159	3,18	1,224	-1,650	24,833	24,861
160	3,20	1,252	-1,185	25,007	25,028
161	3,22	1,235	-1,770	24,961	24,993
162	3,24	1,199	-1,899	24,705	24,739
163	3,26	1,311	-1,860	24,356	24,390
164	3,28	1,197	-1,208	24,895	24,916
165	3,30	1,260	-1,646	25,219	25,247
166	3,32	1,213	-2,190	24,494	24,537
167	3,34	1,197	-1,665	24,821	24,849
168	3,36	1,206	-1,381	24,961	24,983
169	3,38	1,163	-1,472	24,900	24,925
170	3,40	1,270	-1,819	24,948	24,980
171	3,42	1,126	-1,692	24,644	24,673
172	3,44	1,251	-1,390	24,781	24,803
173	3,46	1,195	-1,774	25,126	25,157
174	3,48	1,184	-1,820	24,838	24,870
175	3,50	1,229	-1,680	24,739	24,768
176	3,52	1,164	-1,885	25,015	25,049
177	3,54	1,300	-1,672	24,938	24,966
178	3,56	1,145	-1,764	25,080	25,111
179	3,58	1,210	-1,646	25,000	25,027
180	3,60	1,221	-1,789	25,009	25,042
181	3,62	1,181	-1,902	25,004	25,038
182	3,64	1,236	-1,979	25,089	25,125
183	3,66	1,198	-1,683	24,880	24,908
184	3,68	1,286	-1,622	25,002	25,031
185	3,70	1,198	-1,741	25,072	25,102
186	3,72	1,287	-1,630	24,947	24,974
187	3,74	1,208	-2,101	25,146	25,187
188	3,76	1,188	-1,806	25,116	25,149
189	3,78	1,264	-1,988	24,893	24,931
190	3,80	1,182	-1,890	25,028	25,062
191	3,82	1,322	-2,338	25,071	25,119
192	3,84	1,232	-1,871	24,939	24,975
193	3,86	1,254	-1,670	25,261	25,290
194	3,88	1,272	-2,560	25,014	25,069
195	3,90	1,242	-1,525	25,326	25,351
196	3,92	1,311	-2,091	25,176	25,218
197	3,94	1,241	-1,747	25,163	25,194
198	3,96	1,290	-1,306	25,440	25,488
199	3,98	1,277	-1,271	25,287	25,329
200	4,00	1,274	-1,719	24,850	24,912

201	4,02	1,350	-1,454	25,006	25,059
202	4,04	1,273	-1,375	25,498	25,549
203	4,06	1,335	-1,558	25,106	25,161
204	4,08	1,247	-1,490	24,612	24,665
205	4,10	1,310	-1,637	24,954	25,016
206	4,12	1,297	-1,295	25,444	25,492
207	4,14	1,299	-1,464	25,176	25,229
208	4,16	1,310	-1,457	25,023	25,072
209	4,18	1,274	-1,675	24,582	24,648
210	4,20	1,332	-1,347	25,170	25,220
211	4,22	1,294	-1,290	25,365	25,412
212	4,24	1,293	-1,446	24,714	24,764
213	4,26	1,339	-1,418	24,727	24,776
214	4,28	1,310	-1,662	25,121	25,186
215	4,30	1,320	-1,494	25,065	25,121
216	4,32	1,300	-1,172	25,387	25,426
217	4,34	1,324	-1,469	24,383	24,435
218	4,36	1,316	-1,436	24,739	24,791
219	4,38	1,294	-1,461	25,261	25,315
220	4,40	1,306	-1,552	24,931	24,991
221	4,42	1,262	-1,450	24,779	24,828
222	4,44	1,290	-1,522	24,663	24,719
223	4,46	1,264	-1,385	25,116	25,165
224	4,48	1,306	-1,464	25,409	25,457
225	4,50	1,332	-1,507	25,030	25,081
226	4,52	1,317	-1,382	25,022	25,068
227	4,54	1,314	-1,332	25,592	25,641
228	4,56	1,264	-1,408	25,550	25,602
229	4,58	1,375	-1,458	24,889	24,940
230	4,60	1,219	-1,550	24,838	24,894
231	4,62	1,312	-1,398	24,663	24,718
232	4,64	1,332	-1,568	25,065	25,122
233	4,66	1,241	-1,609	24,804	24,863
234	4,68	1,290	-1,663	24,471	24,532
235	4,70	1,266	-1,838	24,558	24,633
236	4,72	1,290	-1,571	25,418	25,478
237	4,74	1,288	-1,645	25,187	25,247
238	4,76	1,317	-1,476	25,059	25,108
239	4,78	1,262	-1,562	24,774	24,831
240	4,80	1,293	-1,396	25,375	25,426
241	4,82	1,264	-1,354	25,491	25,538
242	4,84	1,270	-1,454	25,225	25,273
243	4,86	1,325	-1,230	25,025	25,065
244	4,88	1,296	-1,545	25,451	25,506
245	4,90	1,286	-1,162	25,864	25,901
246	4,92	1,260	-1,545	25,170	25,221
247	4,94	1,236	-1,412	24,991	25,038
248	4,96	1,348	-1,544	25,359	25,416
249	4,98	1,311	-1,391	25,351	25,401
250	5,00	1,328	-1,616	25,173	25,231



Berdasarkan grafik diatas, nilai tahanan model kapal menggunakan *bulbous bow* terjadi pada waktu 2,5 – 3,0 s. Sehingga apabila dirata – ratakan nilai tahanan model kapal 2,475 N.

LAMPIRAN 6

Lampiran 6.

Penentuan nilai tahanan model kapal tanpa menggunakan *bulbous bow* pada tiap variasi kecepatan.

- Kecepatan 0,406 m/s

Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	1,344	-1,366	-0,752	1,685
1	0,02	6,377	-8,009	33,804	34,092
2	0,04	6,028	3,322	26,759	26,824
3	0,06	6,051	9,621	26,779	28,803
4	0,08	5,470	-1,846	29,220	29,252
5	0,10	5,848	1,147	30,848	30,860
6	0,12	5,469	2,170	21,342	21,480
7	0,14	5,662	8,941	27,072	27,515
8	0,16	5,525	3,280	20,036	20,117
9	0,18	5,392	4,879	21,131	21,807
10	0,20	5,640	-1,274	30,422	30,437
11	0,22	5,371	-1,648	30,673	30,728
12	0,24	5,391	-3,145	16,713	17,067
13	0,26	5,490	-1,945	27,802	27,839
14	0,28	5,341	-2,214	28,924	29,029
15	0,30	5,315	-1,771	17,063	17,180
16	0,32	5,261	-0,773	39,324	39,338
17	0,34	5,353	-0,649	22,750	22,767
18	0,36	5,207	0,894	16,785	16,818
19	0,38	5,155	0,015	35,009	35,014
20	0,40	5,284	1,256	17,810	17,868
21	0,42	5,197	0,912	16,194	16,228
22	0,44	4,862	0,588	31,582	31,592
23	0,46	4,485	0,516	14,759	14,774
24	0,48	4,948	-0,227	15,468	15,472
25	0,50	4,529	-0,054	29,279	29,283
26	0,52	4,321	-0,154	11,651	11,657
27	0,54	4,421	-0,962	16,477	16,516
28	0,56	4,232	-0,117	26,970	26,973
29	0,58	4,089	-0,122	10,834	10,840
30	0,60	3,975	-0,470	18,311	18,321
31	0,62	3,861	0,200	25,840	25,843
32	0,64	3,618	-0,708	11,997	12,025
33	0,66	3,449	-0,457	21,707	21,714
34	0,68	3,197	-0,339	26,891	26,895
35	0,70	3,054	-0,996	14,718	14,760
36	0,72	3,086	-0,133	25,907	25,908
37	0,74	3,041	-0,184	27,643	27,645
38	0,76	2,925	-0,556	16,841	16,855
39	0,78	2,776	0,048	28,214	28,215
40	0,80	2,408	0,070	26,534	26,535
41	0,82	2,791	-0,150	17,674	17,678
42	0,84	2,562	0,447	28,853	28,858
43	0,86	2,296	0,279	24,297	24,301
44	0,88	2,112	0,098	18,554	18,557
45	0,90	2,048	0,511	28,931	28,938
46	0,92	2,077	0,258	23,015	23,020
47	0,94	2,005	0,143	19,921	19,924
48	0,96	2,027	0,401	29,555	29,560
49	0,98	2,183	-0,003	22,873	22,875
50	1,00	1,925	-0,040	22,189	22,190

51	1,02	1,518	0,078	31,045	31,046
52	1,04	1,944	-0,162	23,104	23,106
53	1,06	1,512	-0,179	25,307	25,308
54	1,08	1,821	0,009	31,460	31,461
55	1,10	1,729	-0,255	23,091	23,094
56	1,12	1,765	-0,130	26,477	26,478
57	1,14	1,789	0,142	29,867	29,868
58	1,16	1,555	-0,330	21,712	21,717
59	1,18	1,623	-0,094	25,874	25,875
60	1,20	1,671	0,027	27,291	27,292
61	1,22	1,522	-0,321	20,168	20,172
62	1,24	1,553	-0,056	25,442	25,443
63	1,26	1,450	-0,130	25,465	25,466
64	1,28	1,386	-0,290	19,913	19,916
65	1,30	1,365	-0,205	25,860	25,862
66	1,32	1,131	-0,293	24,684	24,687
67	1,34	1,162	-0,420	20,549	20,555
68	1,36	1,047	-0,311	26,582	26,584
69	1,38	0,955	-0,391	24,036	24,041
70	1,40	1,107	-0,410	21,094	21,100
71	1,42	0,830	-0,255	26,491	26,493
72	1,44	0,885	-0,259	22,692	22,694
73	1,46	0,941	-0,364	21,043	21,047
74	1,48	0,944	-0,048	25,363	25,363
75	1,50	0,870	-0,319	21,421	21,425
76	1,52	0,805	-0,206	20,508	20,510
77	1,54	0,818	-0,048	24,680	24,681
78	1,56	0,846	-0,222	20,290	20,292
79	1,58	0,846	-0,088	20,967	20,968
80	1,60	0,831	-0,062	24,505	24,506
81	1,62	0,774	-0,134	20,095	20,096
82	1,64	0,648	-0,018	21,877	21,878
83	1,66	0,728	0,034	24,345	24,346
84	1,68	0,791	-0,167	20,201	20,203
85	1,70	0,664	-0,057	22,667	22,668
86	1,72	0,736	-0,181	24,258	24,260
87	1,74	0,536	-0,222	20,432	20,434
88	1,76	0,567	-0,141	23,050	23,051
89	1,78	0,471	-0,117	23,706	23,708
90	1,80	0,474	-0,311	20,533	20,537
91	1,82	0,476	-0,092	23,820	23,821
92	1,84	0,477	-0,092	23,498	23,499
93	1,86	0,472	-0,251	21,066	21,069
94	1,88	0,503	-0,114	24,653	24,655
95	1,90	0,427	-0,115	23,140	23,142
96	1,92	0,513	-0,122	21,740	21,742
97	1,94	0,492	-0,076	25,085	25,086
98	1,96	0,508	-0,002	23,396	23,397
99	1,98	0,489	-0,205	22,552	22,555
100	2,00	0,511	-0,241	25,492	25,494

101	2,02	0,476	-0,318	23,435	23,439
102	2,04	0,569	-0,284	23,061	23,065
103	2,06	0,538	-0,130	25,799	25,801
104	2,08	0,610	-0,095	23,137	23,139
105	2,10	0,588	0,004	23,656	23,658
106	2,12	0,539	-0,065	25,850	25,852
107	2,14	0,535	-0,185	23,626	23,629
108	2,16	0,489	0,051	24,117	24,119
109	2,18	0,509	-0,065	25,936	25,938
110	2,20	0,532	-0,012	23,395	23,398
111	2,22	0,528	-0,116	24,861	24,863
112	2,24	0,486	-0,010	25,451	25,453
113	2,26	0,514	-0,156	23,493	23,496
114	2,28	0,486	0,032	24,727	24,729
115	2,30	0,539	-0,007	25,273	25,275
116	2,32	0,520	-0,053	22,930	22,932
117	2,34	0,557	-0,140	24,895	24,898
118	2,36	0,526	0,121	24,672	24,674
119	2,38	0,495	-0,101	23,100	23,102
120	2,40	0,420	0,006	24,422	24,424
121	2,42	0,435	-0,181	24,109	24,112
122	2,44	0,370	-0,035	22,615	22,617
123	2,46	0,402	-0,087	24,492	24,494
124	2,48	0,397	-0,286	23,752	23,755
125	2,50	0,384	-0,292	22,935	22,938
126	2,52	0,402	-0,269	24,326	24,329
127	2,54	0,400	-0,305	23,112	23,116
128	2,56	0,376	-0,230	22,545	22,548
129	2,58	0,365	-0,179	23,937	23,939
130	2,60	0,332	-0,260	22,811	22,814
131	2,62	0,308	-0,280	22,775	22,778
132	2,64	0,306	-0,273	23,879	23,882
133	2,66	0,260	-0,321	22,908	22,911
134	2,68	0,322	-0,264	22,844	22,848
135	2,70	0,312	-0,304	23,578	23,581
136	2,72	0,269	-0,237	22,583	22,586
137	2,74	0,293	-0,266	23,243	23,246
138	2,76	0,257	-0,194	23,600	23,602
139	2,78	0,281	-0,282	22,552	22,555
140	2,80	0,267	-0,230	23,211	23,213
141	2,82	0,263	-0,156	23,647	23,649
142	2,84	0,251	-0,350	22,500	22,505
143	2,86	0,266	-0,243	23,633	23,636
144	2,88	0,240	-0,091	23,772	23,773
145	2,90	0,248	-0,338	22,961	22,965
146	2,92	0,223	-0,130	23,951	23,953
147	2,94	0,233	-0,278	23,823	23,826
148	2,96	0,243	-0,338	23,294	23,298
149	2,98	0,232	-0,260	24,231	24,234
150	3,00	0,254	-0,370	24,000	24,005

151	3,02	0,225	-0,349	23,476	23,480
152	3,04	0,228	-0,477	24,650	24,657
153	3,06	0,239	-0,523	23,870	23,878
154	3,08	0,253	-0,524	23,811	23,819
155	3,10	0,255	-0,548	24,813	24,821
156	3,12	0,278	-0,552	24,222	24,231
157	3,14	0,244	-0,697	24,127	24,140
158	3,16	0,277	-0,600	24,866	24,876
159	3,18	0,275	-0,448	24,146	24,152
160	3,20	0,305	-0,480	24,355	24,363
161	3,22	0,322	-0,867	24,967	24,987
162	3,24	0,316	-0,639	24,186	24,198
163	3,26	0,354	-0,696	24,509	24,524
164	3,28	0,346	-0,631	24,903	24,916
165	3,30	0,356	-0,731	24,139	24,155
166	3,32	0,351	-0,637	24,680	24,692
167	3,34	0,363	-0,433	24,894	24,901
168	3,36	0,365	-0,547	24,373	24,384
169	3,38	0,378	-0,642	25,178	25,191
170	3,40	0,385	-0,487	24,946	24,955
171	3,42	0,403	-0,555	24,676	24,688
172	3,44	0,392	-0,447	25,032	25,040
173	3,46	0,395	-0,436	24,868	24,876
174	3,48	0,400	-0,486	24,613	24,622
175	3,50	0,390	-0,343	25,101	25,107
176	3,52	0,409	-0,344	24,638	24,645
177	3,54	0,410	-0,353	24,221	24,228
178	3,56	0,422	-0,333	24,790	24,797
179	3,58	0,407	-0,270	24,180	24,185
180	3,60	0,412	-0,209	24,215	24,220
181	3,62	0,418	-0,150	24,424	24,429
182	3,64	0,427	-0,196	23,932	23,937
183	3,66	0,423	-0,236	23,733	23,739
184	3,68	0,426	-0,142	24,009	24,013
185	3,70	0,449	-0,062	23,708	23,713
186	3,72	0,423	-0,179	23,596	23,601
187	3,74	0,425	-0,122	23,636	23,640
188	3,76	0,410	-0,217	22,937	22,942
189	3,78	0,395	-0,101	23,104	23,108
190	3,80	0,397	-0,215	23,444	23,448
191	3,82	0,347	-0,127	22,987	22,991
192	3,84	0,346	-0,222	23,216	23,220
193	3,86	0,333	-0,346	23,191	23,197
194	3,88	0,327	-0,271	23,002	23,006
195	3,90	0,387	-0,295	23,296	23,302
196	3,92	0,391	-0,390	23,204	23,211
197	3,94	0,368	-0,292	22,582	22,588
198	3,96	0,419	-0,152	22,779	22,784
199	3,98	0,295	-0,297	22,600	22,605
200	4,00	0,307	-0,213	22,316	22,320

201	4,02	0,299	-0,292	23,019	23,023
202	4,04	0,294	-0,200	22,869	22,872
203	4,06	0,325	-0,237	22,658	22,662
204	4,08	0,282	-0,248	22,939	22,942
205	4,10	0,311	-0,174	22,501	22,505
206	4,12	0,364	-0,150	22,748	22,752
207	4,14	0,310	-0,408	23,111	23,118
208	4,16	0,322	-0,331	22,937	22,943
209	4,18	0,303	-0,289	22,841	22,845
210	4,20	0,311	-0,332	22,962	22,967
211	4,22	0,332	-0,300	22,583	22,588
212	4,24	0,333	-0,417	22,864	22,871
213	4,26	0,350	-0,293	23,073	23,078
214	4,28	0,326	-0,458	22,642	22,650
215	4,30	0,322	-0,450	22,750	22,758
216	4,32	0,320	-0,451	22,982	22,990
217	4,34	0,308	-0,587	22,760	22,771
218	4,36	0,310	-0,494	23,227	23,236
219	4,38	0,306	-0,567	23,258	23,268
220	4,40	0,313	-0,616	23,402	23,415
221	4,42	0,325	-0,626	23,561	23,574
222	4,44	0,345	-0,685	23,730	23,745
223	4,46	0,332	-0,765	23,440	23,457
224	4,48	0,359	-0,767	23,799	23,817
225	4,50	0,351	-0,896	23,609	23,633
226	4,52	0,377	-0,828	23,472	23,493
227	4,54	0,354	-0,865	23,927	23,949
228	4,56	0,376	-0,778	23,495	23,514
229	4,58	0,366	-0,907	23,637	23,661
230	4,60	0,351	-0,751	24,129	24,146
231	4,62	0,361	-0,691	23,974	23,989
232	4,64	0,344	-0,697	24,003	24,018
233	4,66	0,363	-0,693	24,562	24,577
234	4,68	0,348	-0,632	24,329	24,342
235	4,70	0,409	-0,801	24,438	24,458
236	4,72	0,384	-0,647	24,494	24,507
237	4,74	0,384	-0,565	23,975	23,987
238	4,76	0,388	-0,541	24,107	24,118
239	4,78	0,388	-0,543	24,251	24,261
240	4,80	0,380	-0,456	23,931	23,939
241	4,82	0,371	-0,400	23,973	23,981
242	4,84	0,378	-0,388	23,777	23,784
243	4,86	0,363	-0,147	23,295	23,299
244	4,88	0,374	-0,111	23,458	23,462
245	4,90	0,355	-0,126	23,588	23,592
246	4,92	0,373	-0,145	23,468	23,472
247	4,94	0,368	-0,050	23,588	23,592
248	4,96	0,367	-0,213	23,487	23,492
249	4,98	0,379	-0,080	23,128	23,132
250	5,00	0,382	-0,174	23,506	23,510

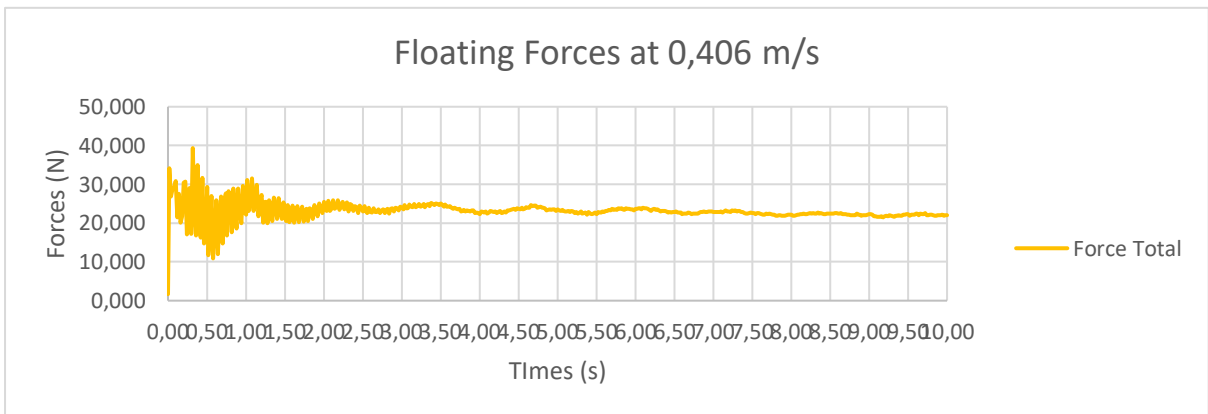
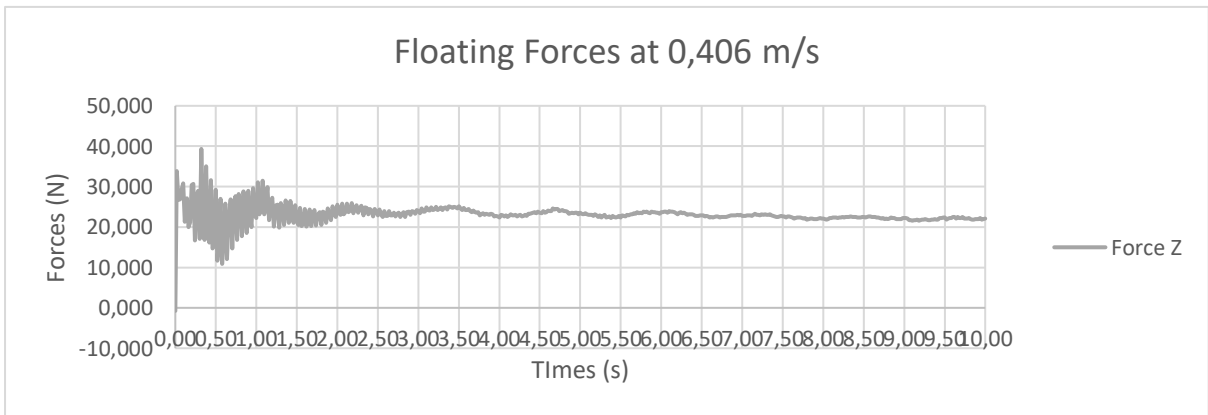
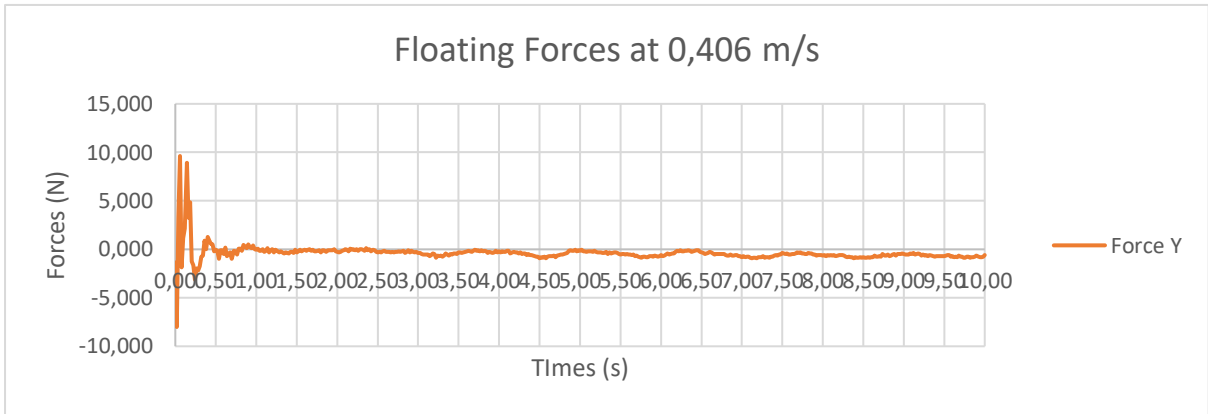
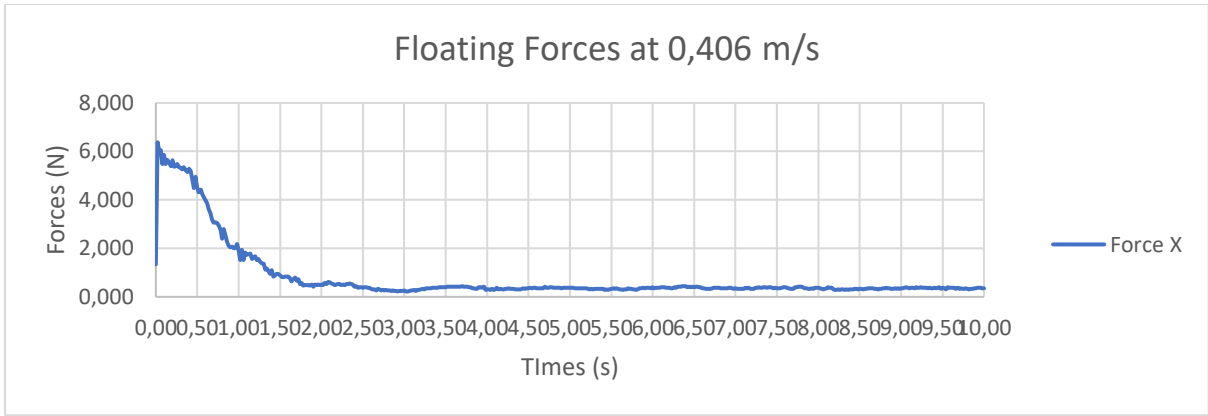
251	5,02	0,371	-0,061	23,324	23,328
252	5,04	0,374	-0,192	23,135	23,139
253	5,06	0,359	-0,196	23,408	23,412
254	5,08	0,355	-0,281	23,139	23,145
255	5,10	0,356	-0,220	22,966	22,971
256	5,12	0,346	-0,215	22,982	22,986
257	5,14	0,357	-0,205	23,066	23,070
258	5,16	0,348	-0,275	22,812	22,817
259	5,18	0,355	-0,146	23,169	23,172
260	5,20	0,342	-0,254	22,933	22,937
261	5,22	0,338	-0,309	22,544	22,549
262	5,24	0,303	-0,294	22,869	22,874
263	5,26	0,324	-0,337	22,409	22,415
264	5,28	0,313	-0,365	22,761	22,767
265	5,30	0,328	-0,357	22,995	23,001
266	5,32	0,319	-0,272	22,408	22,412
267	5,34	0,330	-0,490	22,531	22,540
268	5,36	0,324	-0,336	22,674	22,679
269	5,38	0,330	-0,415	22,187	22,195
270	5,40	0,319	-0,396	22,783	22,790
271	5,42	0,293	-0,317	22,503	22,508
272	5,44	0,309	-0,299	22,312	22,316
273	5,46	0,291	-0,358	22,468	22,474
274	5,48	0,310	-0,469	22,731	22,739
275	5,50	0,328	-0,525	22,296	22,306
276	5,52	0,345	-0,460	22,840	22,849
277	5,54	0,332	-0,481	22,725	22,733
278	5,56	0,353	-0,559	22,654	22,665
279	5,58	0,327	-0,480	22,982	22,990
280	5,60	0,315	-0,529	22,841	22,851
281	5,62	0,299	-0,511	23,103	23,112
282	5,64	0,296	-0,596	23,118	23,129
283	5,66	0,317	-0,562	23,404	23,414
284	5,68	0,303	-0,722	23,312	23,328
285	5,70	0,342	-0,623	23,612	23,625
286	5,72	0,321	-0,742	23,374	23,391
287	5,74	0,321	-0,805	23,572	23,591
288	5,76	0,310	-0,844	23,404	23,425
289	5,78	0,301	-0,731	23,855	23,870
290	5,80	0,294	-0,753	23,724	23,741
291	5,82	0,308	-0,794	23,801	23,820
292	5,84	0,343	-0,819	23,534	23,554
293	5,86	0,344	-0,712	23,427	23,443
294	5,88	0,374	-0,723	23,809	23,826
295	5,90	0,361	-0,752	23,681	23,699
296	5,92	0,383	-0,666	23,665	23,679
297	5,94	0,374	-0,719	23,499	23,515
298	5,96	0,381	-0,779	23,514	23,533
299	5,98	0,362	-0,710	23,313	23,330
300	6,00	0,388	-0,598	23,736	23,749

301	6,02	0,351	-0,680	23,651	23,665
302	6,04	0,377	-0,644	23,855	23,868
303	6,06	0,364	-0,521	23,864	23,874
304	6,08	0,374	-0,443	23,524	23,532
305	6,10	0,387	-0,551	23,892	23,903
306	6,12	0,392	-0,460	23,800	23,809
307	6,14	0,394	-0,451	23,849	23,858
308	6,16	0,374	-0,405	23,691	23,699
309	6,18	0,376	-0,251	23,421	23,425
310	6,20	0,372	-0,137	23,132	23,136
311	6,22	0,357	-0,227	23,524	23,528
312	6,24	0,358	-0,112	23,664	23,668
313	6,26	0,395	-0,211	23,453	23,458
314	6,28	0,377	-0,195	23,483	23,487
315	6,30	0,423	-0,164	23,258	23,263
316	6,32	0,412	-0,170	23,043	23,048
317	6,34	0,427	-0,108	23,086	23,091
318	6,36	0,437	-0,172	23,100	23,105
319	6,38	0,430	-0,265	23,108	23,114
320	6,40	0,433	-0,181	23,003	23,008
321	6,42	0,405	-0,147	22,756	22,761
322	6,44	0,410	-0,080	22,816	22,821
323	6,46	0,398	-0,092	22,734	22,738
324	6,48	0,410	-0,281	22,850	22,856
325	6,50	0,400	-0,313	22,826	22,832
326	6,52	0,408	-0,366	22,948	22,956
327	6,54	0,428	-0,484	22,681	22,692
328	6,56	0,393	-0,435	22,710	22,719
329	6,58	0,395	-0,365	22,652	22,660
330	6,60	0,355	-0,283	22,324	22,329
331	6,62	0,355	-0,318	22,426	22,432
332	6,64	0,327	-0,448	22,389	22,397
333	6,66	0,319	-0,525	22,497	22,507
334	6,68	0,319	-0,502	22,677	22,686
335	6,70	0,336	-0,492	22,617	22,626
336	6,72	0,361	-0,501	22,361	22,371
337	6,74	0,365	-0,497	22,437	22,447
338	6,76	0,372	-0,458	22,487	22,496
339	6,78	0,378	-0,478	22,441	22,450
340	6,80	0,375	-0,571	22,492	22,504
341	6,82	0,362	-0,657	22,643	22,658
342	6,84	0,356	-0,644	22,815	22,829
343	6,86	0,352	-0,532	22,865	22,876
344	6,88	0,359	-0,627	22,931	22,945
345	6,90	0,362	-0,626	22,845	22,859
346	6,92	0,383	-0,579	22,853	22,866
347	6,94	0,373	-0,601	22,966	22,978
348	6,96	0,352	-0,684	22,944	22,959
349	6,98	0,333	-0,675	22,965	22,980
350	7,00	0,348	-0,794	22,816	22,836

351	7,02	0,329	-0,725	22,781	22,797
352	7,04	0,327	-0,805	22,774	22,794
353	7,06	0,323	-0,732	22,829	22,846
354	7,08	0,319	-0,755	22,864	22,882
355	7,10	0,333	-0,866	22,913	22,935
356	7,12	0,372	-0,901	22,707	22,732
357	7,14	0,361	-0,864	23,018	23,041
358	7,16	0,367	-0,891	23,222	23,246
359	7,18	0,338	-0,899	22,969	22,993
360	7,20	0,330	-0,785	22,980	22,999
361	7,22	0,328	-0,827	22,899	22,920
362	7,24	0,369	-0,828	23,205	23,226
363	7,26	0,377	-0,725	23,080	23,097
364	7,28	0,386	-0,847	23,210	23,232
365	7,30	0,384	-0,796	23,042	23,062
366	7,32	0,380	-0,809	23,058	23,079
367	7,34	0,401	-0,885	23,083	23,107
368	7,36	0,394	-0,750	22,907	22,925
369	7,38	0,385	-0,743	22,791	22,809
370	7,40	0,395	-0,663	22,605	22,620
371	7,42	0,398	-0,574	22,475	22,487
372	7,44	0,374	-0,636	22,476	22,490
373	7,46	0,359	-0,532	22,596	22,606
374	7,48	0,363	-0,525	22,733	22,743
375	7,50	0,346	-0,384	22,625	22,632
376	7,52	0,358	-0,409	22,574	22,581
377	7,54	0,354	-0,484	22,291	22,301
378	7,56	0,377	-0,453	22,622	22,631
379	7,58	0,385	-0,543	22,565	22,576
380	7,60	0,385	-0,529	22,492	22,504
381	7,62	0,372	-0,458	22,331	22,341
382	7,64	0,354	-0,493	22,152	22,162
383	7,66	0,332	-0,454	22,190	22,198
384	7,68	0,327	-0,321	22,412	22,418
385	7,70	0,338	-0,385	22,345	22,352
386	7,72	0,389	-0,331	22,407	22,414
387	7,74	0,393	-0,451	22,251	22,260
388	7,76	0,410	-0,436	22,138	22,147
389	7,78	0,415	-0,474	22,206	22,216
390	7,80	0,415	-0,493	21,822	21,833
391	7,82	0,370	-0,364	21,916	21,923
392	7,84	0,347	-0,439	22,075	22,083
393	7,86	0,353	-0,447	22,037	22,045
394	7,88	0,323	-0,561	21,948	21,960
395	7,90	0,332	-0,538	21,948	21,959
396	7,92	0,348	-0,626	21,936	21,950
397	7,94	0,338	-0,581	22,043	22,055
398	7,96	0,381	-0,595	22,197	22,211
399	7,98	0,372	-0,600	22,097	22,110
400	8,00	0,371	-0,620	22,121	22,135

401	8,02	0,353	-0,566	21,904	21,916
402	8,04	0,339	-0,687	21,865	21,881
403	8,06	0,313	-0,586	21,955	21,967
404	8,08	0,334	-0,627	22,165	22,178
405	8,10	0,350	-0,597	22,215	22,228
406	8,12	0,393	-0,644	22,293	22,308
407	8,14	0,369	-0,582	22,333	22,346
408	8,16	0,374	-0,690	22,416	22,433
409	8,18	0,312	-0,661	22,264	22,278
410	8,20	0,288	-0,586	22,342	22,353
411	8,22	0,284	-0,607	22,407	22,419
412	8,24	0,303	-0,618	22,550	22,563
413	8,26	0,291	-0,671	22,394	22,408
414	8,28	0,314	-0,749	22,531	22,549
415	8,30	0,315	-0,805	22,493	22,513
416	8,32	0,289	-0,745	22,433	22,450
417	8,34	0,301	-0,828	22,656	22,676
418	8,36	0,280	-0,815	22,447	22,467
419	8,38	0,307	-0,921	22,499	22,524
420	8,40	0,308	-0,832	22,457	22,478
421	8,42	0,313	-0,856	22,311	22,333
422	8,44	0,329	-0,840	22,304	22,326
423	8,46	0,321	-0,799	22,385	22,405
424	8,48	0,319	-0,840	22,431	22,453
425	8,50	0,320	-0,815	22,445	22,465
426	8,52	0,331	-0,879	22,381	22,404
427	8,54	0,312	-0,869	22,457	22,479
428	8,56	0,321	-0,830	22,600	22,621
429	8,58	0,323	-0,869	22,577	22,599
430	8,60	0,343	-0,809	22,492	22,512
431	8,62	0,353	-0,834	22,467	22,489
432	8,64	0,347	-0,673	22,538	22,553
433	8,66	0,360	-0,759	22,334	22,353
434	8,68	0,337	-0,768	22,328	22,347
435	8,70	0,324	-0,688	22,257	22,273
436	8,72	0,315	-0,779	22,114	22,133
437	8,74	0,326	-0,484	22,162	22,171
438	8,76	0,327	-0,629	21,960	21,973
439	8,78	0,343	-0,628	22,043	22,057
440	8,80	0,347	-0,551	22,021	22,032
441	8,82	0,366	-0,678	22,071	22,087
442	8,84	0,349	-0,652	22,368	22,382
443	8,86	0,343	-0,553	22,199	22,211
444	8,88	0,330	-0,490	22,166	22,175
445	8,90	0,332	-0,629	21,900	21,914
446	8,92	0,350	-0,470	22,025	22,034
447	8,94	0,336	-0,497	21,966	21,976
448	8,96	0,356	-0,465	22,010	22,019
449	8,98	0,340	-0,423	22,162	22,170
450	9,00	0,346	-0,479	22,286	22,296

451	9,02	0,346	-0,558	22,252	22,264
452	9,04	0,366	-0,519	22,135	22,145
453	9,06	0,385	-0,516	21,711	21,722
454	9,08	0,376	-0,421	21,690	21,699
455	9,10	0,361	-0,462	21,542	21,552
456	9,12	0,373	-0,383	21,642	21,650
457	9,14	0,378	-0,560	21,647	21,659
458	9,16	0,359	-0,504	21,781	21,791
459	9,18	0,403	-0,445	21,500	21,510
460	9,20	0,367	-0,461	21,752	21,761
461	9,22	0,376	-0,664	21,818	21,833
462	9,24	0,397	-0,561	21,810	21,823
463	9,26	0,370	-0,634	21,996	22,010
464	9,28	0,370	-0,572	21,874	21,886
465	9,30	0,382	-0,696	21,675	21,693
466	9,32	0,360	-0,600	21,675	21,688
467	9,34	0,382	-0,661	21,838	21,853
468	9,36	0,356	-0,693	21,819	21,835
469	9,38	0,354	-0,739	21,965	21,983
470	9,40	0,370	-0,710	21,840	21,857
471	9,42	0,354	-0,702	21,893	21,910
472	9,44	0,363	-0,677	22,193	22,209
473	9,46	0,390	-0,727	22,167	22,185
474	9,48	0,336	-0,727	22,305	22,322
475	9,50	0,365	-0,726	22,309	22,326
476	9,52	0,359	-0,626	21,874	21,888
477	9,54	0,310	-0,569	22,115	22,126
478	9,56	0,390	-0,616	22,196	22,210
479	9,58	0,366	-0,762	22,178	22,197
480	9,60	0,371	-0,678	22,478	22,494
481	9,62	0,376	-0,796	22,465	22,486
482	9,64	0,368	-0,775	22,056	22,076
483	9,66	0,341	-0,794	22,447	22,467
484	9,68	0,382	-0,653	22,249	22,264
485	9,70	0,330	-0,756	22,274	22,292
486	9,72	0,342	-0,766	22,510	22,528
487	9,74	0,329	-0,866	22,043	22,066
488	9,76	0,324	-0,873	22,059	22,083
489	9,78	0,344	-0,760	22,094	22,113
490	9,80	0,338	-0,763	22,215	22,234
491	9,82	0,319	-0,857	21,978	22,000
492	9,84	0,330	-0,837	21,811	21,834
493	9,86	0,335	-0,833	21,856	21,878
494	9,88	0,348	-0,733	21,969	21,987
495	9,90	0,356	-0,662	22,019	22,034
496	9,92	0,372	-0,735	21,972	21,991
497	9,94	0,364	-0,820	22,176	22,198
498	9,96	0,364	-0,785	21,821	21,842
499	9,98	0,354	-0,739	22,025	22,043
500	10,00	0,356	-0,619	22,071	22,084



Berdasarkan grafik diatas, nilai tahanan model kapal menggunakan tanpa *bulbous bow* terjadi pada waktu 8,0 – 8,5 s. Sehingga apabila dirata – ratakan nilai tahanan model kapal 0,645 N.

- Kecepatan 0,488 m/s

Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	1,344	-1,502	-0,752	1,685
1	0,02	5,092	-9,695	66,564	33,637
2	0,04	5,299	3,548	53,216	26,672
3	0,06	5,072	10,001	26,484	14,160
4	0,08	6,369	-1,981	42,105	21,076
5	0,10	6,650	1,107	45,119	22,566
6	0,12	6,718	2,512	21,102	10,631
7	0,14	5,507	9,117	52,796	26,789
8	0,16	5,716	3,214	37,312	18,727
9	0,18	5,830	5,290	18,873	19,609
10	0,20	5,361	-1,215	43,607	29,085
11	0,22	5,405	-2,309	28,201	28,298
12	0,24	5,455	-2,729	14,002	14,271
13	0,26	4,317	-1,632	38,569	38,605
14	0,28	4,644	-2,431	25,895	26,013
15	0,30	4,443	-0,982	15,935	15,972
16	0,32	4,223	-1,686	36,981	37,028
17	0,34	4,263	0,422	20,600	20,612
18	0,36	4,198	1,039	15,901	15,938
19	0,38	4,220	-0,115	34,407	34,414
20	0,40	4,250	1,208	18,315	18,358
21	0,42	4,123	1,082	17,412	17,450
22	0,44	4,012	0,683	32,706	32,715
23	0,46	3,859	0,661	17,736	17,750
24	0,48	3,857	-0,646	19,729	19,740
25	0,50	3,730	0,116	33,356	33,358
26	0,52	3,756	-0,538	15,257	15,268
27	0,54	3,326	-1,331	22,365	22,406
28	0,56	3,101	-0,159	32,673	32,675
29	0,58	3,131	-0,531	16,153	16,163
30	0,60	3,027	-0,303	23,002	23,006
31	0,62	3,227	0,110	30,742	30,743
32	0,64	3,071	-0,382	16,955	16,961
33	0,66	2,963	-0,001	24,460	24,462
34	0,68	2,874	-0,045	28,800	28,801
35	0,70	2,824	-0,315	16,773	16,777
36	0,72	2,721	-0,114	26,876	26,879
37	0,74	2,651	-0,311	26,426	26,431
38	0,76	2,111	-0,450	16,794	16,803
39	0,78	2,064	0,327	28,350	28,352
40	0,80	2,107	-0,596	26,076	26,085
41	0,82	2,214	-0,932	16,832	16,864
42	0,84	2,132	0,303	28,750	28,753
43	0,86	2,033	-0,119	24,703	24,704
44	0,88	1,995	-0,702	19,036	19,051
45	0,90	1,867	-0,212	28,784	28,786
46	0,92	1,744	0,094	23,250	23,251
47	0,94	1,846	-0,476	20,789	20,796
48	0,96	1,337	-0,139	28,899	28,900
49	0,98	1,541	-0,122	22,503	22,505
50	1,00	1,733	-0,168	21,300	21,301

51	1,02	1,236	-0,271	29,567	29,571
52	1,04	1,181	-0,422	20,898	20,904
53	1,06	1,194	0,120	23,060	23,062
54	1,08	1,107	-0,049	28,506	28,507
55	1,10	1,162	-0,612	20,618	20,629
56	1,12	1,140	-0,233	24,346	24,348
57	1,14	1,129	0,170	27,667	27,669
58	1,16	1,082	-0,488	20,523	20,530
59	1,18	1,101	-0,458	24,950	24,956
60	1,20	1,023	-0,044	26,987	26,989
61	1,22	0,813	-0,556	20,366	20,375
62	1,24	0,986	-0,393	25,860	25,866
63	1,26	0,911	-0,365	25,821	25,825
64	1,28	0,903	-0,486	20,829	20,838
65	1,30	0,815	-0,406	26,250	26,255
66	1,32	0,888	-0,586	25,175	25,184
67	1,34	0,859	-0,382	20,994	20,999
68	1,36	0,864	-0,468	26,641	26,646
69	1,38	0,724	-0,436	24,152	24,158
70	1,40	0,692	-0,530	21,840	21,848
71	1,42	0,720	-0,367	26,652	26,657
72	1,44	0,524	-0,454	23,097	23,103
73	1,46	0,516	-0,588	22,367	22,377
74	1,48	0,439	-0,282	26,646	26,649
75	1,50	0,566	-0,520	22,891	22,899
76	1,52	0,495	-0,410	22,514	22,519
77	1,54	0,339	-0,425	26,254	26,259
78	1,56	0,473	-0,342	22,477	22,482
79	1,58	0,396	-0,309	22,994	22,998
80	1,60	0,447	-0,248	26,076	26,079
81	1,62	0,325	-0,287	21,886	21,889
82	1,64	0,391	-0,187	23,289	23,292
83	1,66	0,383	0,030	25,564	25,566
84	1,68	0,367	-0,157	21,603	21,606
85	1,70	0,367	-0,065	23,962	23,964
86	1,72	0,280	-0,296	25,474	25,477
87	1,74	0,326	-0,085	21,244	21,246
88	1,76	0,302	0,190	24,600	24,603
89	1,78	0,394	0,017	25,167	25,170
90	1,80	0,265	-0,102	21,385	21,387
91	1,82	0,278	0,162	24,284	24,286
92	1,84	0,303	0,130	24,453	24,455
93	1,86	0,316	-0,077	21,672	21,674
94	1,88	0,353	0,062	25,081	25,083
95	1,90	0,248	-0,113	23,561	23,562
96	1,92	0,342	0,009	21,889	21,891
97	1,94	0,281	0,140	24,946	24,948
98	1,96	0,368	-0,029	23,613	23,615
99	1,98	0,311	-0,188	22,641	22,643
100	2,00	0,271	0,179	24,835	24,837

101	2,02	0,317	0,062	22,956	22,958
102	2,04	0,277	-0,131	22,691	22,693
103	2,06	0,327	-0,027	25,118	25,120
104	2,08	0,239	0,000	22,536	22,537
105	2,10	0,330	-0,439	23,318	23,324
106	2,12	0,254	-0,113	25,252	25,253
107	2,14	0,339	-0,315	22,851	22,856
108	2,16	0,315	-0,233	23,544	23,547
109	2,18	0,268	-0,251	24,435	24,438
110	2,20	0,339	-0,275	22,791	22,795
111	2,22	0,282	-0,292	23,577	23,581
112	2,24	0,347	-0,202	24,644	24,647
113	2,26	0,273	-0,412	22,692	22,697
114	2,28	0,310	-0,314	23,978	23,981
115	2,30	0,288	-0,291	24,408	24,411
116	2,32	0,348	-0,495	22,738	22,746
117	2,34	0,312	-0,445	24,165	24,171
118	2,36	0,313	-0,265	24,143	24,146
119	2,38	0,345	-0,586	23,143	23,153
120	2,40	0,315	-0,430	24,427	24,432
121	2,42	0,417	-0,376	24,111	24,117
122	2,44	0,297	-0,593	22,958	22,968
123	2,46	0,356	-0,418	24,304	24,310
124	2,48	0,373	-0,450	23,836	23,843
125	2,50	0,368	-0,566	23,118	23,127
126	2,52	0,378	-0,322	24,651	24,656
127	2,54	0,357	-0,625	23,385	23,396
128	2,56	0,412	-0,560	23,379	23,389
129	2,58	0,354	-0,439	24,640	24,646
130	2,60	0,412	-0,500	23,947	23,956
131	2,62	0,359	-0,527	23,451	23,459
132	2,64	0,357	-0,456	24,428	24,435
133	2,66	0,363	-0,350	23,592	23,597
134	2,68	0,380	-0,520	23,858	23,866
135	2,70	0,380	-0,417	24,505	24,512
136	2,72	0,325	-0,403	23,058	23,064
137	2,74	0,375	-0,328	23,638	23,643
138	2,76	0,377	-0,357	24,269	24,274
139	2,78	0,420	-0,278	23,429	23,434
140	2,80	0,371	-0,383	24,135	24,140
141	2,82	0,355	-0,415	24,140	24,146
142	2,84	0,371	-0,309	23,396	23,400
143	2,86	0,361	-0,404	24,115	24,121
144	2,88	0,404	-0,270	24,383	24,387
145	2,90	0,338	-0,387	23,485	23,490
146	2,92	0,391	-0,267	24,332	24,337
147	2,94	0,354	-0,344	24,112	24,117
148	2,96	0,388	-0,253	23,513	23,517
149	2,98	0,322	-0,234	24,351	24,354
150	3,00	0,344	-0,412	23,849	23,854

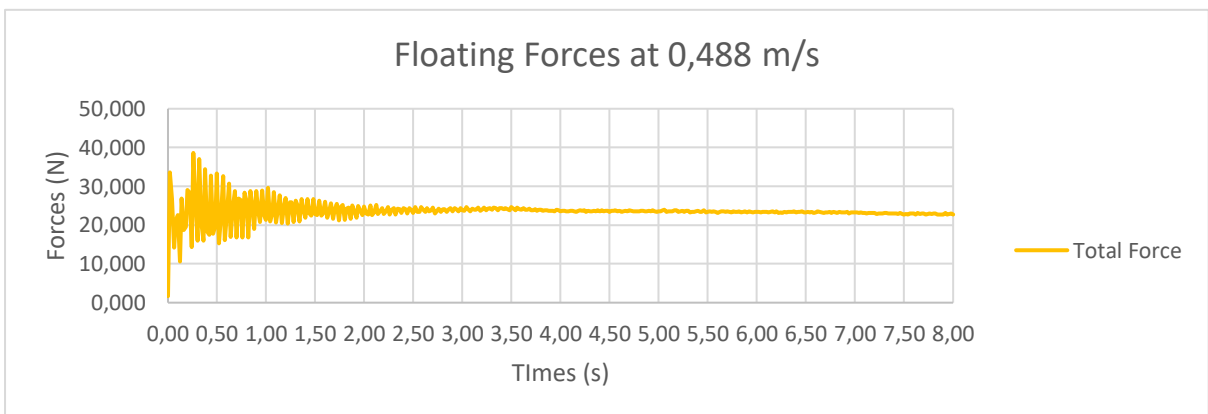
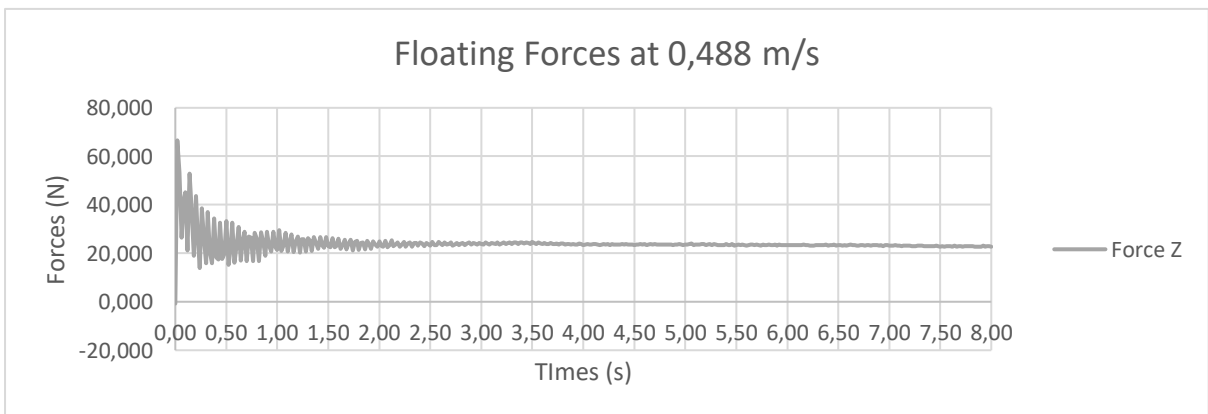
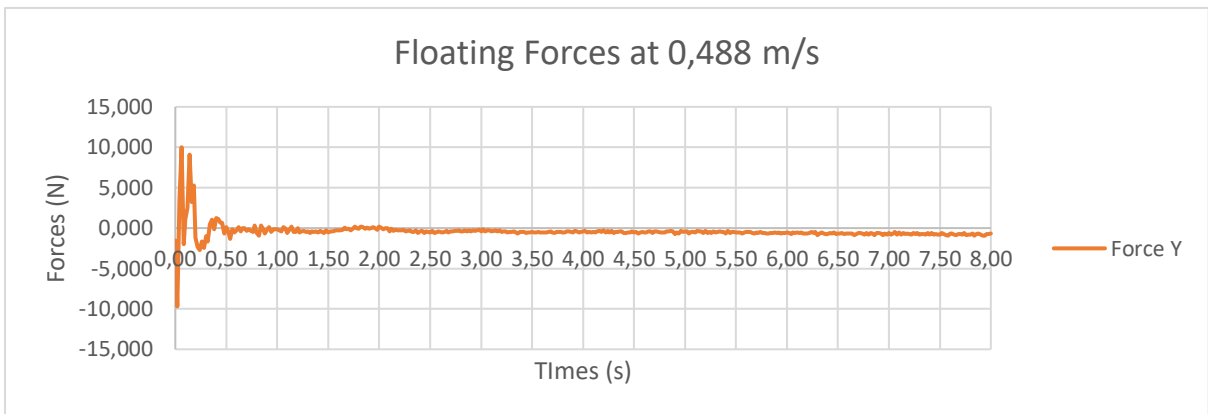
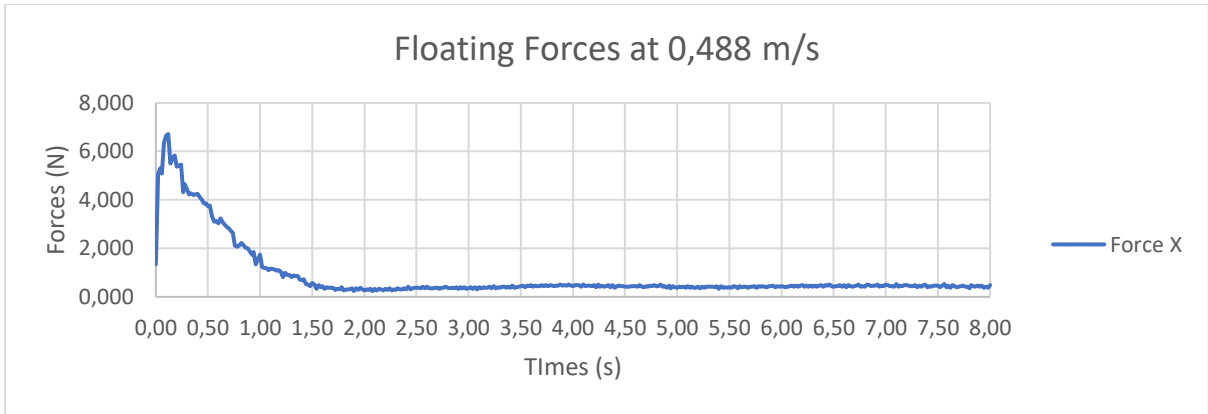
151	3,02	0,388	-0,138	23,664	23,667
152	3,04	0,338	-0,422	24,574	24,580
153	3,06	0,404	-0,258	24,079	24,083
154	3,08	0,310	-0,307	23,520	23,524
155	3,10	0,399	-0,394	24,269	24,275
156	3,12	0,361	-0,329	23,932	23,936
157	3,14	0,388	-0,299	23,900	23,905
158	3,16	0,373	-0,396	24,562	24,568
159	3,18	0,369	-0,296	23,662	23,667
160	3,20	0,418	-0,461	24,017	24,025
161	3,22	0,360	-0,406	24,484	24,489
162	3,24	0,438	-0,413	23,760	23,767
163	3,26	0,342	-0,555	24,175	24,183
164	3,28	0,395	-0,456	24,362	24,370
165	3,30	0,382	-0,477	23,894	23,901
166	3,32	0,411	-0,411	24,467	24,473
167	3,34	0,413	-0,532	24,383	24,392
168	3,36	0,379	-0,653	23,752	23,763
169	3,38	0,424	-0,454	24,376	24,383
170	3,40	0,378	-0,508	24,397	24,405
171	3,42	0,470	-0,500	24,038	24,048
172	3,44	0,364	-0,623	24,411	24,421
173	3,46	0,403	-0,525	24,153	24,162
174	3,48	0,422	-0,525	23,822	23,831
175	3,50	0,449	-0,503	24,626	24,635
176	3,52	0,456	-0,557	24,186	24,197
177	3,54	0,396	-0,556	23,751	23,760
178	3,56	0,457	-0,489	24,448	24,456
179	3,58	0,429	-0,523	24,029	24,038
180	3,60	0,492	-0,548	23,892	23,903
181	3,62	0,426	-0,533	24,353	24,362
182	3,64	0,452	-0,568	23,886	23,897
183	3,66	0,446	-0,485	23,882	23,891
184	3,68	0,435	-0,415	24,220	24,227
185	3,70	0,491	-0,527	23,801	23,811
186	3,72	0,432	-0,596	23,860	23,871
187	3,74	0,479	-0,445	24,028	24,036
188	3,76	0,431	-0,449	23,640	23,648
189	3,78	0,488	-0,458	23,933	23,942
190	3,80	0,467	-0,515	23,985	23,994
191	3,82	0,443	-0,527	23,678	23,688
192	3,84	0,466	-0,396	23,776	23,783
193	3,86	0,470	-0,408	23,800	23,808
194	3,88	0,500	-0,508	23,693	23,703
195	3,90	0,458	-0,569	23,734	23,745
196	3,92	0,494	-0,366	23,655	23,662
197	3,94	0,452	-0,443	23,550	23,558
198	3,96	0,510	-0,511	23,920	23,930
199	3,98	0,463	-0,508	23,779	23,788
200	4,00	0,430	-0,390	23,475	23,482

201	4,02	0,489	-0,354	23,655	23,662
202	4,04	0,481	-0,517	23,724	23,734
203	4,06	0,492	-0,473	23,512	23,522
204	4,08	0,418	-0,567	23,480	23,490
205	4,10	0,502	-0,471	23,731	23,740
206	4,12	0,443	-0,568	23,704	23,715
207	4,14	0,463	-0,385	23,532	23,539
208	4,16	0,451	-0,343	23,363	23,370
209	4,18	0,431	-0,461	23,661	23,669
210	4,20	0,488	-0,293	23,788	23,794
211	4,22	0,385	-0,523	23,690	23,699
212	4,24	0,497	-0,362	23,763	23,770
213	4,26	0,421	-0,558	23,452	23,462
214	4,28	0,462	-0,348	23,724	23,731
215	4,30	0,425	-0,583	23,529	23,539
216	4,32	0,445	-0,494	23,543	23,552
217	4,34	0,479	-0,452	23,683	23,692
218	4,36	0,401	-0,437	23,586	23,594
219	4,38	0,479	-0,408	23,779	23,787
220	4,40	0,368	-0,613	23,588	23,599
221	4,42	0,450	-0,617	23,786	23,798
222	4,44	0,459	-0,573	23,596	23,607
223	4,46	0,429	-0,531	23,647	23,657
224	4,48	0,447	-0,415	23,634	23,642
225	4,50	0,416	-0,566	23,447	23,457
226	4,52	0,427	-0,466	23,648	23,656
227	4,54	0,408	-0,659	23,613	23,625
228	4,56	0,445	-0,527	23,838	23,848
229	4,58	0,439	-0,508	23,576	23,585
230	4,60	0,437	-0,511	23,717	23,726
231	4,62	0,421	-0,550	23,361	23,371
232	4,64	0,474	-0,439	23,509	23,517
233	4,66	0,426	-0,411	23,735	23,742
234	4,68	0,403	-0,622	23,498	23,509
235	4,70	0,437	-0,422	23,802	23,809
236	4,72	0,426	-0,422	23,621	23,629
237	4,74	0,452	-0,470	23,520	23,529
238	4,76	0,442	-0,558	23,522	23,533
239	4,78	0,478	-0,553	23,594	23,605
240	4,80	0,442	-0,535	23,577	23,587
241	4,82	0,434	-0,413	23,624	23,631
242	4,84	0,499	-0,434	23,643	23,651
243	4,86	0,416	-0,355	23,510	23,516
244	4,88	0,449	-0,434	23,472	23,480
245	4,90	0,382	-0,719	23,614	23,628
246	4,92	0,462	-0,540	23,532	23,542
247	4,94	0,357	-0,655	23,778	23,789
248	4,96	0,441	-0,348	23,588	23,595
249	4,98	0,395	-0,495	23,348	23,356
250	5,00	0,380	-0,442	23,554	23,561

251	5,02	0,419	-0,382	23,553	23,559
252	5,04	0,398	-0,655	23,756	23,768
253	5,06	0,409	-0,481	23,921	23,929
254	5,08	0,382	-0,468	23,377	23,384
255	5,10	0,432	-0,520	23,589	23,598
256	5,12	0,369	-0,361	23,486	23,491
257	5,14	0,409	-0,413	23,598	23,605
258	5,16	0,370	-0,436	23,773	23,779
259	5,18	0,382	-0,593	23,803	23,813
260	5,20	0,424	-0,349	23,423	23,429
261	5,22	0,360	-0,594	23,522	23,532
262	5,24	0,425	-0,445	23,726	23,734
263	5,26	0,370	-0,602	23,402	23,413
264	5,28	0,410	-0,401	23,699	23,706
265	5,30	0,410	-0,526	23,651	23,660
266	5,32	0,409	-0,464	23,331	23,338
267	5,34	0,416	-0,386	23,439	23,445
268	5,36	0,386	-0,495	23,459	23,467
269	5,38	0,435	-0,451	23,476	23,484
270	5,40	0,322	-0,662	23,732	23,743
271	5,42	0,433	-0,336	23,435	23,441
272	5,44	0,367	-0,624	23,392	23,403
273	5,46	0,392	-0,466	23,747	23,755
274	5,48	0,378	-0,497	23,242	23,250
275	5,50	0,389	-0,546	23,381	23,390
276	5,52	0,381	-0,556	23,572	23,581
277	5,54	0,431	-0,525	23,456	23,465
278	5,56	0,416	-0,648	23,482	23,494
279	5,58	0,362	-0,522	23,409	23,417
280	5,60	0,430	-0,495	23,193	23,202
281	5,62	0,390	-0,467	23,357	23,364
282	5,64	0,425	-0,505	23,573	23,582
283	5,66	0,428	-0,598	23,484	23,495
284	5,68	0,379	-0,701	23,382	23,395
285	5,70	0,410	-0,551	23,539	23,548
286	5,72	0,421	-0,631	23,329	23,341
287	5,74	0,441	-0,475	23,211	23,220
288	5,76	0,371	-0,597	23,572	23,582
289	5,78	0,448	-0,590	23,366	23,377
290	5,80	0,408	-0,657	23,440	23,452
291	5,82	0,429	-0,647	23,535	23,547
292	5,84	0,424	-0,623	23,270	23,281
293	5,86	0,395	-0,620	23,343	23,355
294	5,88	0,429	-0,525	23,555	23,565
295	5,90	0,429	-0,585	23,251	23,262
296	5,92	0,454	-0,510	23,572	23,582
297	5,94	0,394	-0,663	23,334	23,346
298	5,96	0,448	-0,602	23,284	23,295
299	5,98	0,425	-0,593	23,363	23,374
300	6,00	0,430	-0,514	23,435	23,444

301	6,02	0,428	-0,640	23,389	23,402
302	6,04	0,404	-0,729	23,308	23,322
303	6,06	0,414	-0,512	23,345	23,354
304	6,08	0,443	-0,604	23,350	23,362
305	6,10	0,468	-0,523	23,350	23,360
306	6,12	0,426	-0,620	23,313	23,325
307	6,14	0,460	-0,561	23,385	23,396
308	6,16	0,415	-0,645	23,491	23,503
309	6,18	0,451	-0,698	23,303	23,317
310	6,20	0,475	-0,660	23,471	23,484
311	6,22	0,420	-0,632	23,124	23,136
312	6,24	0,464	-0,473	23,193	23,202
313	6,26	0,424	-0,585	23,156	23,166
314	6,28	0,453	-0,484	23,335	23,344
315	6,30	0,419	-0,840	23,291	23,309
316	6,32	0,468	-0,662	23,365	23,379
317	6,34	0,425	-0,519	23,353	23,362
318	6,36	0,452	-0,644	23,328	23,341
319	6,38	0,477	-0,717	23,507	23,522
320	6,40	0,428	-0,718	23,223	23,238
321	6,42	0,482	-0,632	23,373	23,386
322	6,44	0,458	-0,700	23,443	23,458
323	6,46	0,505	-0,565	23,595	23,607
324	6,48	0,433	-0,733	23,205	23,220
325	6,50	0,428	-0,678	23,321	23,334
326	6,52	0,438	-0,642	23,433	23,445
327	6,54	0,448	-0,586	23,250	23,261
328	6,56	0,482	-0,717	23,347	23,362
329	6,58	0,419	-0,660	23,157	23,170
330	6,60	0,495	-0,694	23,287	23,302
331	6,62	0,390	-0,656	23,541	23,553
332	6,64	0,492	-0,674	23,431	23,446
333	6,66	0,444	-0,866	23,310	23,330
334	6,68	0,414	-0,739	23,167	23,183
335	6,70	0,444	-0,603	23,244	23,256
336	6,72	0,457	-0,633	23,297	23,310
337	6,74	0,496	-0,654	23,461	23,475
338	6,76	0,424	-0,819	23,078	23,096
339	6,78	0,443	-0,600	23,370	23,381
340	6,80	0,408	-0,827	23,273	23,290
341	6,82	0,509	-0,611	23,137	23,150
342	6,84	0,478	-0,685	23,366	23,381
343	6,86	0,446	-0,862	23,291	23,311
344	6,88	0,451	-0,628	23,260	23,273
345	6,90	0,456	-0,597	23,245	23,257
346	6,92	0,509	-0,653	23,437	23,452
347	6,94	0,422	-0,854	22,928	22,947
348	6,96	0,470	-0,643	23,277	23,291
349	6,98	0,448	-0,783	23,286	23,303
350	7,00	0,496	-0,586	23,212	23,224

351	7,02	0,486	-0,815	23,185	23,204
352	7,04	0,444	-0,696	23,087	23,101
353	7,06	0,435	-0,489	23,296	23,304
354	7,08	0,416	-0,812	23,072	23,089
355	7,10	0,522	-0,536	23,130	23,141
356	7,12	0,416	-0,805	23,010	23,027
357	7,14	0,468	-0,622	23,181	23,194
358	7,16	0,441	-0,708	23,092	23,107
359	7,18	0,481	-0,700	23,129	23,144
360	7,20	0,494	-0,755	23,049	23,066
361	7,22	0,452	-0,831	22,864	22,884
362	7,24	0,440	-0,590	22,958	22,969
363	7,26	0,436	-0,717	22,953	22,968
364	7,28	0,494	-0,612	23,048	23,061
365	7,30	0,401	-0,839	23,101	23,119
366	7,32	0,465	-0,730	23,069	23,084
367	7,34	0,423	-0,757	22,930	22,946
368	7,36	0,476	-0,792	23,029	23,047
369	7,38	0,505	-0,614	22,976	22,990
370	7,40	0,390	-0,801	22,933	22,950
371	7,42	0,451	-0,625	22,998	23,010
372	7,44	0,421	-0,783	22,893	22,910
373	7,46	0,458	-0,741	23,133	23,149
374	7,48	0,453	-0,802	22,866	22,884
375	7,50	0,456	-0,776	22,680	22,697
376	7,52	0,405	-0,576	22,888	22,898
377	7,54	0,462	-0,726	22,731	22,747
378	7,56	0,530	-0,854	22,974	22,995
379	7,58	0,403	-0,916	22,991	23,012
380	7,60	0,462	-0,692	22,938	22,952
381	7,62	0,382	-0,661	22,735	22,747
382	7,64	0,486	-0,790	23,047	23,065
383	7,66	0,437	-0,874	22,790	22,810
384	7,68	0,396	-0,760	22,935	22,951
385	7,70	0,415	-0,735	22,948	22,963
386	7,72	0,446	-0,813	22,663	22,682
387	7,74	0,463	-0,612	22,870	22,882
388	7,76	0,418	-0,878	22,925	22,945
389	7,78	0,421	-0,774	22,878	22,895
390	7,80	0,361	-0,822	22,930	22,947
391	7,82	0,482	-0,677	22,987	23,001
392	7,84	0,450	-0,955	22,713	22,737
393	7,86	0,413	-0,732	22,720	22,735
394	7,88	0,457	-0,698	22,726	22,741
395	7,90	0,421	-0,774	22,693	22,709
396	7,92	0,467	-0,959	23,051	23,075
397	7,94	0,383	-0,916	22,697	22,719
398	7,96	0,410	-0,733	22,857	22,872
399	7,98	0,365	-0,739	23,021	23,036
400	8,00	0,480	-0,656	22,772	22,786



Berdasarkan grafik diatas, nilai tahanan model kapal menggunakan tanpa *bulbous bow* terjadi pada waktu 4,0 – 4,5 s. Sehingga apabila dirata – ratakan nilai tahanan model kapal 0,896 N.

- Kecepatan 0,569 m/s

Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	0,306	-2,623	-0,483	2,411
1	0,02	3,604	20,063	44,603	48,131
2	0,04	4,887	9,478	53,609	54,297
3	0,06	4,796	-3,614	18,547	18,844
4	0,08	5,106	-6,680	35,932	36,439
5	0,10	5,397	8,502	30,996	31,945
6	0,12	5,647	0,879	25,123	25,139
7	0,14	5,915	-8,451	30,523	31,462
8	0,16	5,871	1,467	8,734	8,843
9	0,18	5,859	-0,054	15,535	15,542
10	0,20	5,953	-8,603	30,762	31,727
11	0,22	5,639	-0,685	11,993	12,020
12	0,24	5,612	-4,188	13,062	13,609
13	0,26	5,562	-4,769	26,209	26,562
14	0,28	5,684	-1,869	19,344	19,418
15	0,30	5,078	-1,915	27,279	27,335
16	0,32	5,255	-3,277	32,116	32,253
17	0,34	5,325	-4,878	22,655	23,078
18	0,36	5,185	-0,671	35,356	35,362
19	0,38	4,980	-1,811	35,610	35,653
20	0,40	4,625	-3,767	21,370	21,643
21	0,42	4,592	-0,943	34,486	34,499
22	0,44	4,895	-0,849	30,014	30,028
23	0,46	4,973	-1,538	19,961	20,015
24	0,48	4,875	-1,604	30,849	30,886
25	0,50	4,436	-0,039	23,674	23,675
26	0,52	4,746	0,919	22,311	22,331
27	0,54	4,451	-1,964	27,391	27,450
28	0,56	4,157	-1,644	18,366	18,426
29	0,58	4,125	1,366	22,394	22,428
30	0,60	3,883	-0,326	25,674	25,678
31	0,62	3,345	-1,806	17,978	18,052
32	0,64	3,390	-0,064	24,069	24,070
33	0,66	2,963	-0,670	25,034	25,047
34	0,68	2,954	-1,054	20,239	20,264
35	0,70	2,830	-0,054	26,800	26,802
36	0,72	2,737	-1,510	24,910	24,949
37	0,74	2,262	-0,513	23,586	23,593
38	0,76	2,136	-0,240	29,049	29,051
39	0,78	2,396	-0,909	24,718	24,733
40	0,80	2,268	-0,220	24,380	24,382
41	0,82	2,253	-0,730	29,061	29,070
42	0,84	2,161	-0,306	22,972	22,975
43	0,86	1,977	-0,129	24,160	24,162
44	0,88	1,904	-0,528	27,111	27,117
45	0,90	1,628	-0,021	20,923	20,925
46	0,92	1,792	-0,573	25,013	25,019
47	0,94	1,925	-0,378	25,210	25,215
48	0,96	1,957	0,184	21,250	21,253
49	0,98	1,667	-0,386	26,073	26,077
50	1,00	1,652	0,018	23,525	23,527

51	1,02	1,803	0,006	22,527	22,530
52	1,04	1,643	-0,233	26,260	26,262
53	1,06	1,558	0,150	22,964	22,967
54	1,08	1,580	-0,060	23,531	23,534
55	1,10	1,413	-0,290	26,758	26,761
56	1,12	1,740	-0,021	22,613	22,616
57	1,14	1,428	-0,504	24,366	24,371
58	1,16	1,148	-0,274	26,142	26,145
59	1,18	1,244	-0,136	22,429	22,432
60	1,20	0,970	-0,288	24,726	24,729
61	1,22	0,668	-0,600	25,233	25,241
62	1,24	0,779	-0,384	22,734	22,740
63	1,26	0,629	-0,316	25,296	25,299
64	1,28	0,683	-0,738	24,585	24,597
65	1,30	0,663	-0,444	22,938	22,945
66	1,32	0,588	-0,292	26,039	26,043
67	1,34	0,559	-0,629	24,132	24,141
68	1,36	0,482	-0,826	23,245	23,260
69	1,38	0,471	-0,424	26,045	26,051
70	1,40	0,495	-0,631	23,565	23,575
71	1,42	0,451	-0,785	24,074	24,087
72	1,44	0,480	-0,629	25,865	25,874
73	1,46	0,539	-0,604	23,374	23,384
74	1,48	0,467	-0,509	24,620	24,627
75	1,50	0,429	-0,854	25,176	25,190
76	1,52	0,520	-0,628	23,429	23,439
77	1,54	0,493	-0,532	25,353	25,361
78	1,56	0,466	-0,608	24,883	24,891
79	1,58	0,502	-0,774	23,454	23,467
80	1,60	0,525	-0,515	25,363	25,370
81	1,62	0,479	-0,560	24,617	24,625
82	1,64	0,493	-0,715	23,840	23,852
83	1,66	0,525	-0,547	25,488	25,496
84	1,68	0,501	-0,359	24,122	24,127
85	1,70	0,513	-0,392	24,083	24,089
86	1,72	0,472	-0,330	25,289	25,294
87	1,74	0,516	-0,511	23,961	23,968
88	1,76	0,483	-0,259	24,429	24,432
89	1,78	0,455	-0,476	24,864	24,870
90	1,80	0,474	-0,717	23,492	23,504
91	1,82	0,500	-0,275	24,917	24,921
92	1,84	0,468	-0,157	24,756	24,759
93	1,86	0,448	-0,659	23,587	23,597
94	1,88	0,549	-0,317	24,942	24,947
95	1,90	0,479	-0,162	24,313	24,316
96	1,92	0,441	-0,448	23,848	23,853
97	1,94	0,485	-0,374	25,079	25,084
98	1,96	0,512	-0,365	24,026	24,032
99	1,98	0,446	-0,281	24,339	24,342
100	2,00	0,419	-0,241	24,775	24,778

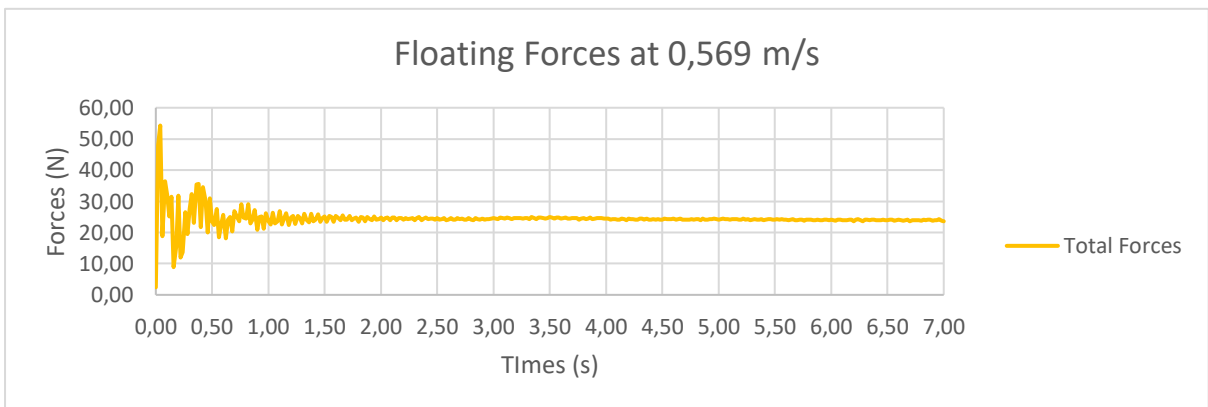
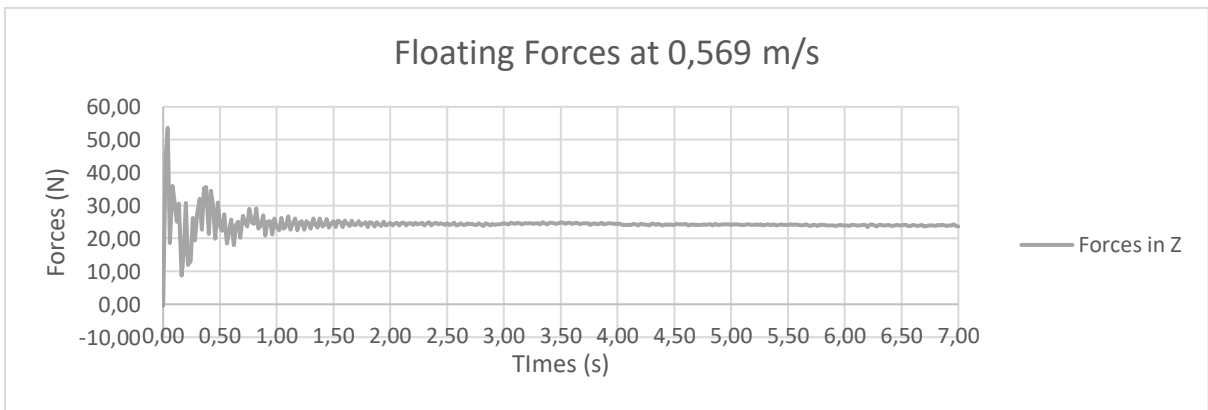
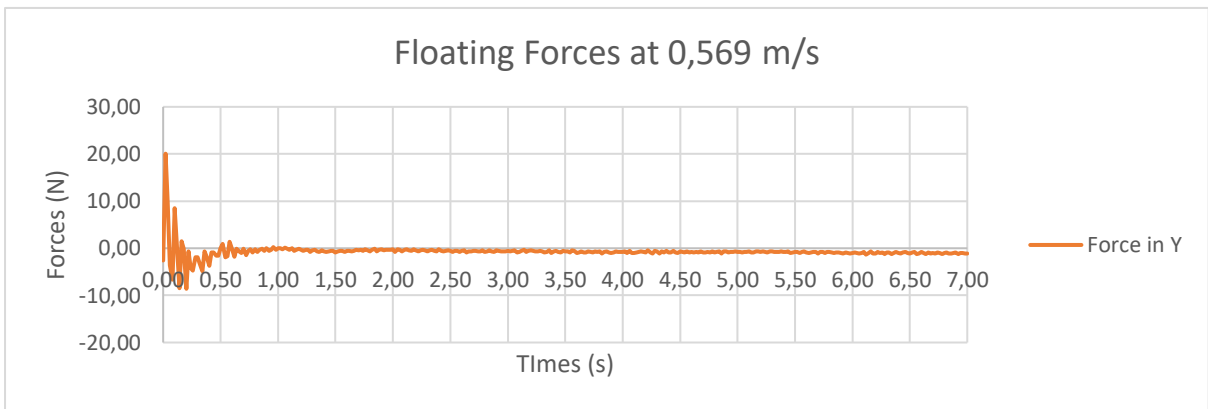
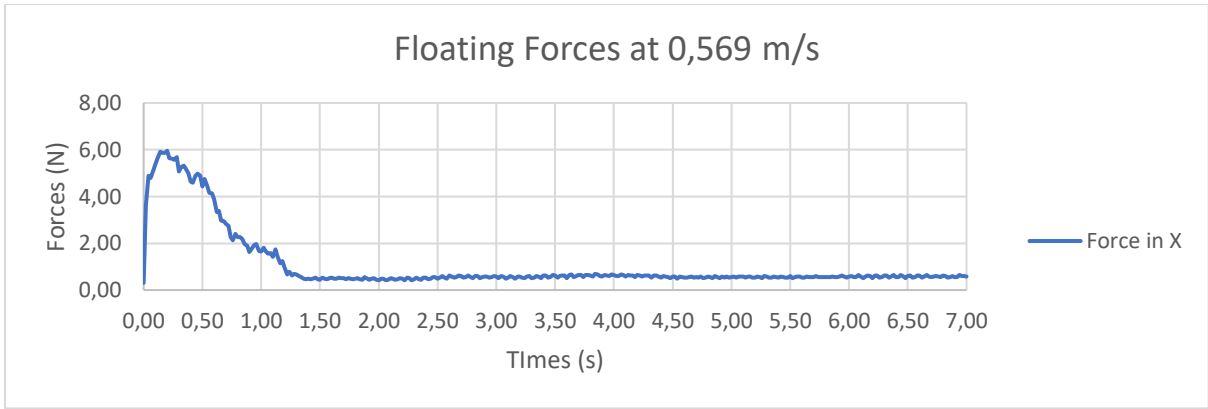
101	2,02	0,484	-0,819	23,952	23,966
102	2,04	0,473	-0,190	24,614	24,618
103	2,06	0,421	-0,293	24,837	24,841
104	2,08	0,445	-0,616	23,878	23,887
105	2,10	0,511	-0,310	24,721	24,725
106	2,12	0,474	-0,173	24,783	24,786
107	2,14	0,430	-0,424	23,903	23,908
108	2,16	0,465	-0,557	24,666	24,673
109	2,18	0,514	-0,188	24,576	24,580
110	2,20	0,476	-0,399	24,090	24,095
111	2,22	0,413	-0,636	24,693	24,701
112	2,24	0,537	-0,415	24,284	24,291
113	2,26	0,499	-0,314	24,382	24,387
114	2,28	0,423	-0,445	24,700	24,705
115	2,30	0,464	-0,627	23,999	24,009
116	2,32	0,522	-0,429	24,538	24,544
117	2,34	0,458	-0,343	24,876	24,880
118	2,36	0,427	-0,549	23,904	23,912
119	2,38	0,533	-0,621	24,470	24,480
120	2,40	0,530	-0,187	24,772	24,776
121	2,42	0,470	-0,564	24,266	24,274
122	2,44	0,485	-0,678	24,523	24,533
123	2,46	0,554	-0,526	24,423	24,432
124	2,48	0,542	-0,457	24,161	24,168
125	2,50	0,475	-0,610	24,535	24,544
126	2,52	0,532	-0,751	24,117	24,130
127	2,54	0,599	-0,571	24,227	24,236
128	2,56	0,526	-0,575	24,685	24,693
129	2,58	0,479	-0,789	23,998	24,011
130	2,60	0,618	-0,575	24,144	24,155
131	2,62	0,585	-0,387	24,627	24,633
132	2,64	0,519	-0,851	24,043	24,059
133	2,66	0,552	-0,660	24,086	24,097
134	2,68	0,615	-0,644	24,642	24,654
135	2,70	0,595	-0,567	24,224	24,234
136	2,72	0,530	-0,586	24,398	24,407
137	2,74	0,549	-0,715	24,132	24,144
138	2,76	0,625	-0,653	24,114	24,126
139	2,78	0,544	-0,437	24,536	24,543
140	2,80	0,503	-0,814	24,155	24,169
141	2,82	0,605	-0,723	23,871	23,884
142	2,84	0,594	-0,405	24,530	24,536
143	2,86	0,516	-0,717	24,206	24,218
144	2,88	0,548	-0,731	24,029	24,041
145	2,90	0,582	-0,488	24,372	24,380
146	2,92	0,574	-0,541	24,181	24,190
147	2,94	0,525	-0,620	24,246	24,256
148	2,96	0,558	-0,690	24,343	24,355
149	2,98	0,598	-0,667	24,473	24,484
150	3,00	0,569	-0,520	24,612	24,620

151	3,02	0,502	-0,661	24,397	24,407
152	3,04	0,598	-0,529	24,289	24,298
153	3,06	0,580	-0,492	24,787	24,795
154	3,08	0,494	-0,870	24,557	24,572
155	3,10	0,524	-0,767	24,381	24,394
156	3,12	0,601	-0,554	24,769	24,778
157	3,14	0,544	-0,322	24,565	24,570
158	3,16	0,491	-0,792	24,317	24,330
159	3,18	0,568	-0,548	24,638	24,646
160	3,20	0,583	-0,428	24,535	24,542
161	3,22	0,525	-0,567	24,576	24,584
162	3,24	0,508	-0,677	24,528	24,539
163	3,26	0,581	-0,656	24,464	24,475
164	3,28	0,604	-0,535	24,647	24,656
165	3,30	0,502	-0,645	24,532	24,542
166	3,32	0,530	-0,881	24,320	24,336
167	3,34	0,607	-0,807	24,872	24,887
168	3,36	0,586	-0,387	24,662	24,669
169	3,38	0,511	-1,022	24,307	24,327
170	3,40	0,617	-0,694	24,765	24,777
171	3,42	0,620	-0,558	24,783	24,793
172	3,44	0,531	-0,808	24,558	24,572
173	3,46	0,549	-0,905	24,512	24,529
174	3,48	0,651	-0,540	24,571	24,580
175	3,50	0,620	-0,668	24,881	24,893
176	3,52	0,525	-0,696	24,714	24,726
177	3,54	0,596	-0,929	24,464	24,482
178	3,56	0,626	-0,491	24,732	24,740
179	3,58	0,612	-0,592	24,791	24,801
180	3,60	0,507	-0,978	24,369	24,388
181	3,62	0,634	-0,870	24,678	24,695
182	3,64	0,659	-0,635	24,739	24,750
183	3,66	0,555	-0,874	24,459	24,476
184	3,68	0,590	-0,860	24,372	24,388
185	3,70	0,648	-0,619	24,542	24,553
186	3,72	0,640	-0,728	24,635	24,649
187	3,74	0,555	-0,859	24,682	24,698
188	3,76	0,641	-0,667	24,181	24,193
189	3,78	0,655	-0,751	24,496	24,510
190	3,80	0,624	-0,615	24,665	24,675
191	3,82	0,581	-1,085	24,328	24,352
192	3,84	0,684	-0,754	24,368	24,383
193	3,86	0,661	-0,669	24,803	24,815
194	3,88	0,603	-0,888	24,226	24,244
195	3,90	0,582	-0,962	24,462	24,481
196	3,92	0,641	-0,915	24,573	24,591
197	3,94	0,624	-0,644	24,545	24,557
198	3,96	0,590	-0,773	24,521	24,535
199	3,98	0,656	-0,751	24,373	24,387
200	4,00	0,644	-0,817	24,400	24,416

201	4,02	0,598	-0,651	24,520	24,531
202	4,04	0,592	-1,059	24,127	24,150
203	4,06	0,672	-0,604	24,196	24,208
204	4,08	0,644	-0,987	24,181	24,202
205	4,10	0,572	-0,957	24,145	24,164
206	4,12	0,642	-0,879	24,071	24,089
207	4,14	0,632	-0,822	24,403	24,419
208	4,16	0,623	-0,650	24,243	24,254
209	4,18	0,551	-0,791	23,877	23,891
210	4,20	0,645	-0,907	24,399	24,418
211	4,22	0,611	-0,494	24,308	24,316
212	4,24	0,569	-0,915	24,263	24,281
213	4,26	0,616	-1,121	24,154	24,180
214	4,28	0,622	-0,537	24,020	24,030
215	4,30	0,622	-0,614	24,460	24,471
216	4,32	0,529	-1,074	24,389	24,412
217	4,34	0,621	-0,708	24,166	24,179
218	4,36	0,611	-0,843	24,451	24,468
219	4,38	0,566	-0,603	24,169	24,179
220	4,40	0,541	-0,947	24,014	24,033
221	4,42	0,587	-0,852	24,322	24,338
222	4,44	0,578	-0,569	24,116	24,126
223	4,46	0,541	-0,860	24,286	24,302
224	4,48	0,508	-0,972	24,094	24,113
225	4,50	0,582	-0,687	24,117	24,129
226	4,52	0,582	-0,801	24,475	24,490
227	4,54	0,490	-0,920	24,275	24,292
228	4,56	0,565	-0,628	24,217	24,227
229	4,58	0,545	-0,852	24,311	24,327
230	4,60	0,538	-0,756	24,432	24,445
231	4,62	0,541	-0,933	24,021	24,039
232	4,64	0,561	-0,743	24,197	24,210
233	4,66	0,569	-0,901	24,349	24,367
234	4,68	0,524	-0,712	24,161	24,173
235	4,70	0,561	-0,868	24,161	24,177
236	4,72	0,523	-0,919	24,139	24,157
237	4,74	0,564	-0,837	24,138	24,153
238	4,76	0,514	-0,887	24,223	24,240
239	4,78	0,526	-0,723	24,163	24,176
240	4,80	0,573	-0,925	24,325	24,344
241	4,82	0,554	-0,791	24,288	24,302
242	4,84	0,518	-0,660	23,973	23,984
243	4,86	0,587	-1,118	24,375	24,400
244	4,88	0,552	-0,619	24,038	24,048
245	4,90	0,502	-0,667	24,176	24,186
246	4,92	0,572	-0,926	24,230	24,249
247	4,94	0,537	-0,838	24,201	24,216
248	4,96	0,566	-0,839	24,354	24,369
249	4,98	0,525	-0,640	24,206	24,216
250	5,00	0,551	-0,756	24,079	24,092

251	5,02	0,578	-0,764	24,228	24,242
252	5,04	0,526	-0,879	24,352	24,369
253	5,06	0,574	-0,805	24,207	24,222
254	5,08	0,572	-0,827	24,183	24,198
255	5,10	0,568	-0,696	24,138	24,150
256	5,12	0,522	-0,880	24,194	24,211
257	5,14	0,571	-0,860	24,272	24,289
258	5,16	0,580	-0,711	24,297	24,310
259	5,18	0,531	-0,679	24,057	24,068
260	5,20	0,540	-0,826	24,080	24,095
261	5,22	0,573	-0,639	24,358	24,369
262	5,24	0,549	-0,766	24,102	24,115
263	5,26	0,511	-0,884	24,199	24,215
264	5,28	0,589	-0,665	23,922	23,934
265	5,30	0,570	-0,690	24,175	24,187
266	5,32	0,538	-0,835	24,237	24,252
267	5,34	0,521	-0,838	24,041	24,056
268	5,36	0,586	-0,784	24,138	24,152
269	5,38	0,551	-0,711	24,224	24,236
270	5,40	0,522	-0,823	23,920	23,935
271	5,42	0,587	-0,800	24,168	24,183
272	5,44	0,542	-0,663	24,301	24,312
273	5,46	0,520	-0,982	24,177	24,196
274	5,48	0,536	-0,950	24,123	24,142
275	5,50	0,598	-0,736	24,062	24,075
276	5,52	0,511	-0,781	24,205	24,218
277	5,54	0,545	-1,017	24,065	24,086
278	5,56	0,578	-0,820	24,225	24,240
279	5,58	0,566	-0,700	24,079	24,091
280	5,60	0,531	-0,844	24,058	24,074
281	5,62	0,538	-0,971	23,931	23,950
282	5,64	0,572	-0,929	24,166	24,184
283	5,66	0,561	-0,830	24,243	24,258
284	5,68	0,553	-0,814	23,928	23,943
285	5,70	0,556	-1,070	23,866	23,890
286	5,72	0,589	-0,810	24,158	24,173
287	5,74	0,550	-0,738	24,067	24,079
288	5,76	0,542	-1,043	23,815	23,837
289	5,78	0,559	-0,828	24,082	24,097
290	5,80	0,561	-0,770	24,085	24,098
291	5,82	0,554	-0,875	24,073	24,090
292	5,84	0,549	-1,049	23,906	23,928
293	5,86	0,585	-0,878	23,970	23,988
294	5,88	0,553	-0,851	24,029	24,045
295	5,90	0,547	-0,982	23,970	23,990
296	5,92	0,571	-1,069	23,855	23,878
297	5,94	0,617	-0,848	24,012	24,029
298	5,96	0,568	-0,981	24,148	24,168
299	5,98	0,532	-1,067	23,916	23,939
300	6,00	0,573	-0,984	24,035	24,055

301	6,02	0,588	-0,853	23,892	23,908
302	6,04	0,557	-0,954	23,777	23,796
303	6,06	0,560	-1,170	24,094	24,121
304	6,08	0,638	-0,984	24,118	24,139
305	6,10	0,568	-0,763	23,921	23,935
306	6,12	0,515	-1,319	23,909	23,942
307	6,14	0,576	-0,980	23,989	24,009
308	6,16	0,622	-0,682	24,161	24,174
309	6,18	0,597	-1,169	24,111	24,138
310	6,20	0,511	-1,114	23,541	23,566
311	6,22	0,627	-0,778	24,042	24,057
312	6,24	0,621	-1,029	24,319	24,341
313	6,26	0,535	-0,886	23,879	23,896
314	6,28	0,557	-1,186	23,611	23,639
315	6,30	0,618	-0,873	24,059	24,076
316	6,32	0,615	-0,945	24,047	24,067
317	6,34	0,536	-1,180	23,906	23,933
318	6,36	0,576	-1,002	24,008	24,029
319	6,38	0,642	-0,745	24,157	24,171
320	6,40	0,558	-0,991	23,903	23,923
321	6,42	0,554	-1,080	23,873	23,897
322	6,44	0,635	-0,914	23,932	23,951
323	6,46	0,600	-0,838	24,157	24,173
324	6,48	0,515	-1,062	23,945	23,967
325	6,50	0,601	-1,080	23,914	23,939
326	6,52	0,632	-0,863	24,048	24,065
327	6,54	0,539	-0,818	24,130	24,145
328	6,56	0,545	-1,208	23,769	23,797
329	6,58	0,616	-1,097	23,848	23,873
330	6,60	0,630	-0,768	24,156	24,170
331	6,62	0,537	-1,001	23,883	23,904
332	6,64	0,570	-1,209	23,758	23,787
333	6,66	0,647	-0,906	23,939	23,958
334	6,68	0,584	-1,090	24,064	24,088
335	6,70	0,543	-0,982	23,650	23,670
336	6,72	0,584	-1,084	23,841	23,865
337	6,74	0,599	-0,935	23,997	24,016
338	6,76	0,569	-1,036	23,944	23,966
339	6,78	0,541	-1,188	23,905	23,933
340	6,80	0,624	-1,034	23,789	23,812
341	6,82	0,588	-0,851	24,154	24,170
342	6,84	0,523	-1,148	23,957	23,983
343	6,86	0,562	-1,150	24,095	24,121
344	6,88	0,596	-0,955	24,004	24,024
345	6,90	0,560	-0,895	23,826	23,843
346	6,92	0,560	-1,267	23,974	24,005
347	6,94	0,643	-0,968	23,956	23,977
348	6,96	0,602	-1,008	24,277	24,299
349	6,98	0,604	-1,103	23,719	23,744
350	7,00	0,581	-1,083	23,577	23,602



Berdasarkan grafik diatas, nilai tahanan model kapal tanpa *bulbous bow* terjadi pada waktu 4,0 – 4,5 s. Sehingga apabila dirata – ratakan nilai tahanan model kapal 1,194 N.

- Kecepatan 0,650 m/s

Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	0,224	-2,951	-0,483	2,411
1	0,02	4,127	21,828	42,679	46,130
2	0,04	4,838	9,947	53,226	53,838
3	0,06	4,551	-3,464	19,920	20,132
4	0,08	5,303	-4,093	37,711	37,861
5	0,10	6,066	8,918	29,353	30,227
6	0,12	6,119	-2,612	23,719	23,821
7	0,14	6,548	-6,346	31,874	32,284
8	0,16	6,277	1,384	9,397	9,479
9	0,18	6,512	-1,014	17,140	17,169
10	0,20	7,592	-8,348	28,036	28,828
11	0,22	7,331	-1,707	13,729	13,813
12	0,24	7,456	-5,290	14,483	15,104
13	0,26	7,845	-2,318	24,424	24,501
14	0,28	7,568	-2,527	21,923	22,022
15	0,30	7,459	-6,464	23,085	23,659
16	0,32	7,092	-0,164	32,628	32,631
17	0,34	7,096	-5,133	24,788	25,131
18	0,36	6,655	-2,227	32,054	32,107
19	0,38	6,527	-1,553	37,225	37,253
20	0,40	6,295	-4,998	19,941	20,344
21	0,42	5,975	0,338	34,268	34,275
22	0,44	5,798	-3,033	29,754	29,859
23	0,46	5,631	-1,363	19,245	19,283
24	0,48	5,188	0,942	32,972	32,986
25	0,50	5,164	-2,531	22,205	22,301
26	0,52	4,895	-0,822	22,153	22,168
27	0,54	4,476	-0,571	28,241	28,246
28	0,56	4,488	0,076	19,216	19,218
29	0,58	4,329	-1,676	22,546	22,588
30	0,60	4,634	-0,717	24,687	24,696
31	0,62	4,689	0,011	19,235	19,238
32	0,64	4,376	-1,898	24,128	24,181
33	0,66	4,138	-0,577	24,575	24,585
34	0,68	4,025	-1,028	20,468	20,488
35	0,70	3,862	-0,606	26,457	26,466
36	0,72	3,744	-1,134	24,416	24,436
37	0,74	3,195	-1,083	22,815	22,834
38	0,76	2,929	-0,458	28,278	28,283
39	0,78	2,683	-0,546	24,352	24,358
40	0,80	2,493	-0,770	24,404	24,415
41	0,82	2,384	-0,569	28,400	28,406
42	0,84	2,014	-0,191	23,415	23,418
43	0,86	1,893	-0,381	24,422	24,426
44	0,88	1,992	-0,597	26,681	26,689
45	0,90	1,721	-0,265	21,852	21,856
46	0,92	1,662	-0,086	24,936	24,939
47	0,94	1,727	-0,626	25,099	25,108
48	0,96	1,516	-0,230	21,482	21,486
49	0,98	1,371	0,210	25,807	25,810
50	1,00	1,629	-0,336	23,536	23,541

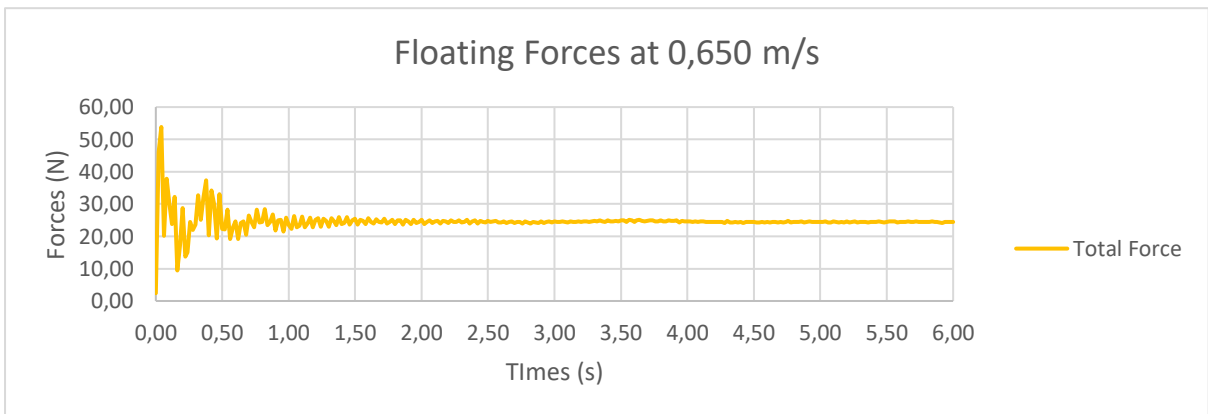
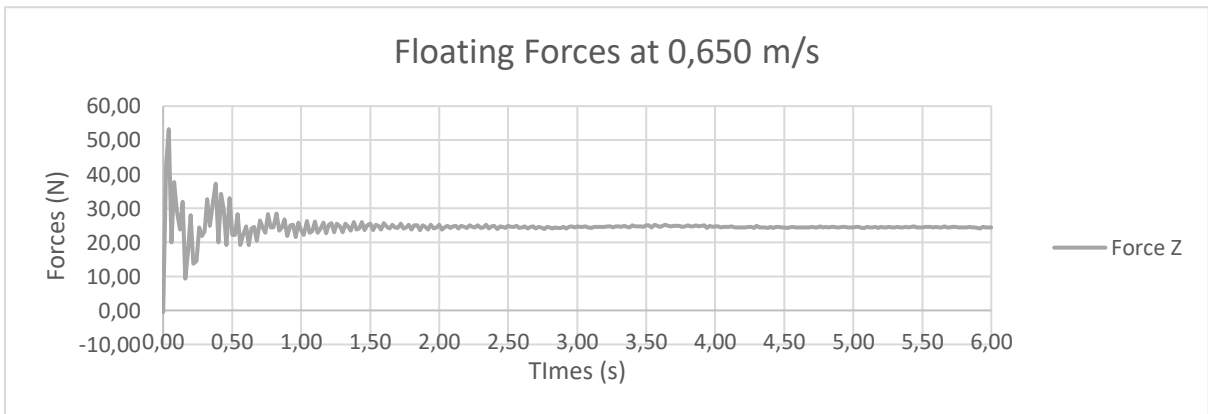
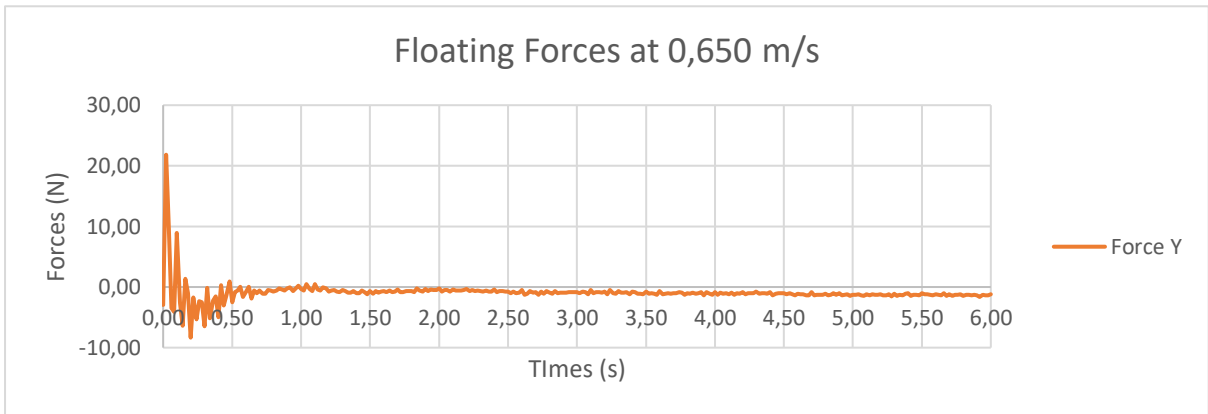
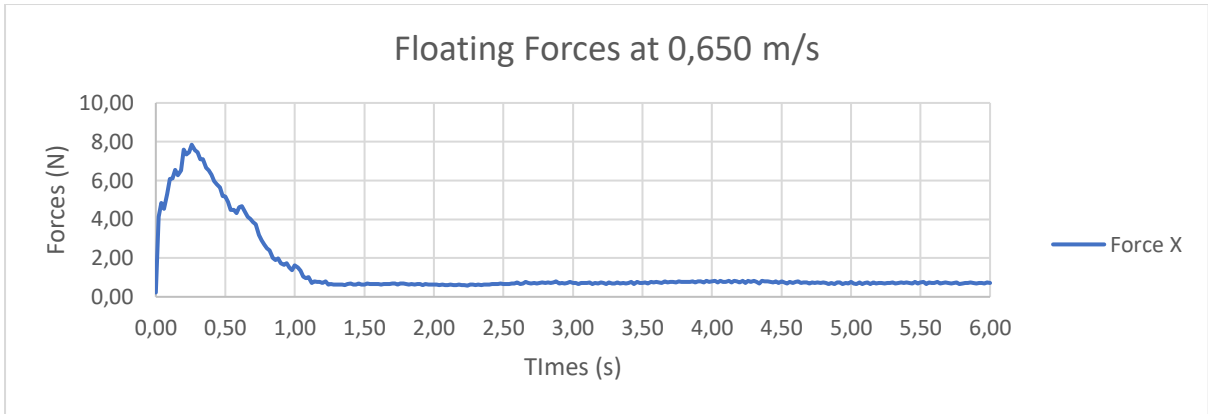
51	1,02	1,524	-0,573	22,225	22,233
52	1,04	1,338	0,443	26,261	26,266
53	1,06	1,035	-0,300	22,738	22,743
54	1,08	0,966	-0,673	23,249	23,258
55	1,10	1,017	0,486	26,086	26,092
56	1,12	0,706	-0,435	22,773	22,779
57	1,14	0,790	-0,561	23,902	23,910
58	1,16	0,773	-0,093	25,738	25,741
59	1,18	0,779	-0,188	22,723	22,727
60	1,20	0,727	-0,742	25,091	25,102
61	1,22	0,784	-0,554	25,635	25,642
62	1,24	0,628	-0,504	22,906	22,913
63	1,26	0,662	-0,723	25,516	25,526
64	1,28	0,625	-0,808	24,697	24,710
65	1,30	0,619	-0,454	22,973	22,980
66	1,32	0,640	-0,671	25,534	25,543
67	1,34	0,643	-0,959	24,674	24,690
68	1,36	0,616	-0,926	23,504	23,520
69	1,38	0,655	-0,654	25,912	25,922
70	1,40	0,698	-0,982	23,741	23,759
71	1,42	0,639	-1,056	24,117	24,135
72	1,44	0,631	-0,558	25,909	25,917
73	1,46	0,692	-0,875	23,607	23,622
74	1,48	0,634	-1,190	24,964	24,986
75	1,50	0,645	-0,672	25,457	25,467
76	1,52	0,678	-1,130	23,555	23,577
77	1,54	0,649	-0,649	25,186	25,195
78	1,56	0,650	-0,948	24,845	24,860
79	1,58	0,656	-0,775	23,806	23,819
80	1,60	0,655	-0,666	25,571	25,581
81	1,62	0,641	-0,871	24,509	24,523
82	1,64	0,656	-0,551	23,994	24,003
83	1,66	0,663	-0,822	25,214	25,227
84	1,68	0,668	-0,770	24,382	24,394
85	1,70	0,675	-0,393	24,292	24,299
86	1,72	0,691	-0,831	25,431	25,445
87	1,74	0,640	-0,832	24,031	24,044
88	1,76	0,679	-0,682	24,449	24,459
89	1,78	0,688	-0,673	25,141	25,151
90	1,80	0,652	-0,708	23,809	23,820
91	1,82	0,640	-0,825	24,922	24,934
92	1,84	0,670	-0,252	24,954	24,959
93	1,86	0,633	-0,591	23,634	23,643
94	1,88	0,650	-0,748	25,067	25,078
95	1,90	0,647	-0,348	24,582	24,587
96	1,92	0,614	-0,658	23,777	23,786
97	1,94	0,657	-0,360	25,102	25,107
98	1,96	0,637	-0,490	24,122	24,130
99	1,98	0,643	-0,515	24,384	24,392
100	2,00	0,628	-0,264	25,157	25,162

101	2,02	0,629	-0,716	23,761	23,772
102	2,04	0,616	-0,530	24,382	24,390
103	2,06	0,630	-0,492	24,911	24,917
104	2,08	0,617	-0,720	24,142	24,152
105	2,10	0,613	-0,446	24,686	24,693
106	2,12	0,641	-0,617	24,804	24,813
107	2,14	0,599	-0,574	24,026	24,034
108	2,16	0,608	-0,551	24,784	24,791
109	2,18	0,623	-0,479	24,603	24,610
110	2,20	0,608	-0,340	24,138	24,144
111	2,22	0,609	-0,687	24,997	25,006
112	2,24	0,587	-0,521	24,463	24,470
113	2,26	0,621	-0,675	24,441	24,451
114	2,28	0,627	-0,560	24,924	24,932
115	2,30	0,612	-0,654	24,220	24,229
116	2,32	0,629	-0,727	24,383	24,393
117	2,34	0,599	-0,579	25,168	25,176
118	2,36	0,640	-0,774	23,987	23,999
119	2,38	0,642	-0,738	24,675	24,686
120	2,40	0,642	-0,433	24,917	24,923
121	2,42	0,655	-0,862	23,976	23,990
122	2,44	0,649	-0,653	24,723	24,732
123	2,46	0,648	-0,696	24,491	24,502
124	2,48	0,699	-0,784	24,223	24,236
125	2,50	0,649	-0,727	24,787	24,798
126	2,52	0,654	-1,005	24,514	24,532
127	2,54	0,668	-0,756	24,565	24,577
128	2,56	0,677	-0,983	24,811	24,828
129	2,58	0,683	-0,918	24,262	24,277
130	2,60	0,736	-0,454	24,360	24,368
131	2,62	0,657	-1,256	24,660	24,685
132	2,64	0,690	-1,079	24,124	24,144
133	2,66	0,782	-0,670	24,478	24,490
134	2,68	0,725	-0,942	24,668	24,685
135	2,70	0,695	-0,869	24,032	24,047
136	2,72	0,728	-1,254	24,486	24,511
137	2,74	0,690	-0,747	24,380	24,392
138	2,76	0,718	-1,137	23,902	23,924
139	2,78	0,752	-0,697	24,595	24,606
140	2,80	0,707	-0,899	24,318	24,333
141	2,82	0,752	-1,121	23,983	24,006
142	2,84	0,719	-0,672	24,394	24,405
143	2,86	0,731	-1,063	24,213	24,233
144	2,88	0,786	-0,960	24,168	24,186
145	2,90	0,686	-0,897	24,581	24,596
146	2,92	0,721	-0,949	24,090	24,107
147	2,94	0,695	-0,827	24,478	24,492
148	2,96	0,711	-0,844	24,656	24,670
149	2,98	0,765	-0,881	24,334	24,349
150	3,00	0,708	-0,883	24,614	24,629

151	3,02	0,723	-1,002	24,487	24,506
152	3,04	0,648	-0,796	24,492	24,504
153	3,06	0,719	-0,833	24,649	24,663
154	3,08	0,709	-1,202	24,365	24,389
155	3,10	0,711	-0,475	24,219	24,227
156	3,12	0,742	-0,993	24,564	24,583
157	3,14	0,667	-0,812	24,513	24,526
158	3,16	0,710	-0,885	24,526	24,541
159	3,18	0,690	-0,906	24,535	24,550
160	3,20	0,736	-0,752	24,472	24,484
161	3,22	0,708	-1,226	24,654	24,678
162	3,24	0,673	-0,532	24,645	24,653
163	3,26	0,734	-1,005	24,386	24,405
164	3,28	0,695	-1,136	24,623	24,644
165	3,30	0,678	-0,662	24,720	24,730
166	3,32	0,729	-0,971	24,529	24,547
167	3,34	0,680	-0,943	24,876	24,891
168	3,36	0,724	-0,848	24,572	24,586
169	3,38	0,692	-1,202	24,407	24,431
170	3,40	0,720	-0,717	24,962	24,974
171	3,42	0,758	-0,878	24,632	24,647
172	3,44	0,663	-1,125	24,622	24,642
173	3,46	0,770	-1,075	24,729	24,749
174	3,48	0,722	-1,191	24,533	24,557
175	3,50	0,719	-0,750	24,986	24,998
176	3,52	0,735	-1,102	24,982	25,002
177	3,54	0,684	-1,057	24,437	24,456
178	3,56	0,764	-1,146	25,115	25,138
179	3,58	0,729	-1,280	24,910	24,936
180	3,60	0,756	-0,710	24,508	24,520
181	3,62	0,745	-1,198	24,880	24,904
182	3,64	0,715	-1,081	25,103	25,123
183	3,66	0,784	-0,997	24,771	24,790
184	3,68	0,740	-1,083	24,673	24,694
185	3,70	0,782	-0,990	24,804	24,822
186	3,72	0,763	-0,982	24,866	24,884
187	3,74	0,743	-0,880	24,872	24,888
188	3,76	0,797	-0,964	24,593	24,611
189	3,78	0,760	-1,282	24,671	24,698
190	3,80	0,777	-1,015	25,003	25,022
191	3,82	0,782	-1,131	24,631	24,654
192	3,84	0,758	-0,895	24,618	24,634
193	3,86	0,789	-1,117	24,960	24,982
194	3,88	0,731	-1,063	24,702	24,722
195	3,90	0,792	-0,869	24,780	24,796
196	3,92	0,801	-1,350	24,940	24,970
197	3,94	0,752	-0,864	24,289	24,305
198	3,96	0,816	-1,118	24,811	24,834
199	3,98	0,781	-1,294	24,581	24,609
200	4,00	0,797	-0,807	24,666	24,681

201	4,02	0,814	-1,251	24,615	24,642
202	4,04	0,743	-0,944	24,431	24,448
203	4,06	0,824	-1,068	24,557	24,578
204	4,08	0,782	-1,006	24,463	24,482
205	4,10	0,774	-1,208	24,591	24,616
206	4,12	0,822	-0,908	24,635	24,652
207	4,14	0,735	-1,246	24,359	24,385
208	4,16	0,829	-1,055	24,400	24,421
209	4,18	0,791	-1,073	24,365	24,386
210	4,20	0,747	-0,825	24,441	24,455
211	4,22	0,824	-1,177	24,390	24,415
212	4,24	0,728	-1,033	24,479	24,498
213	4,26	0,830	-1,024	24,498	24,518
214	4,28	0,757	-0,980	24,192	24,211
215	4,30	0,824	-0,798	24,774	24,789
216	4,32	0,782	-1,076	24,318	24,340
217	4,34	0,699	-1,009	24,336	24,354
218	4,36	0,823	-1,035	24,399	24,420
219	4,38	0,811	-1,118	24,235	24,258
220	4,40	0,794	-0,835	24,524	24,539
221	4,42	0,766	-1,346	24,144	24,173
222	4,44	0,746	-1,074	24,468	24,488
223	4,46	0,800	-1,029	24,463	24,483
224	4,48	0,714	-1,012	24,425	24,443
225	4,50	0,787	-1,058	24,371	24,391
226	4,52	0,750	-1,210	24,207	24,232
227	4,54	0,692	-0,989	24,327	24,345
228	4,56	0,772	-1,218	24,476	24,501
229	4,58	0,724	-1,349	24,301	24,330
230	4,60	0,772	-1,071	24,387	24,408
231	4,62	0,784	-1,182	24,308	24,332
232	4,64	0,707	-1,167	24,389	24,412
233	4,66	0,737	-1,345	24,429	24,458
234	4,68	0,733	-1,384	24,298	24,329
235	4,70	0,695	-0,885	24,515	24,530
236	4,72	0,736	-1,373	24,306	24,336
237	4,74	0,708	-1,256	24,368	24,394
238	4,76	0,750	-1,265	24,687	24,713
239	4,78	0,701	-1,284	24,335	24,361
240	4,80	0,731	-1,073	24,518	24,538
241	4,82	0,716	-1,353	24,403	24,432
242	4,84	0,663	-1,306	24,504	24,530
243	4,86	0,720	-1,024	24,599	24,618
244	4,88	0,649	-1,243	24,300	24,324
245	4,90	0,746	-1,056	24,448	24,467
246	4,92	0,733	-1,411	24,524	24,555
247	4,94	0,655	-1,246	24,496	24,521
248	4,96	0,706	-1,171	24,381	24,404
249	4,98	0,686	-1,479	24,383	24,416
250	5,00	0,765	-1,251	24,391	24,418

251	5,02	0,685	-1,327	24,452	24,479
252	5,04	0,654	-1,221	24,533	24,557
253	5,06	0,747	-1,345	24,254	24,284
254	5,08	0,664	-1,426	24,261	24,292
255	5,10	0,706	-1,171	24,573	24,596
256	5,12	0,741	-1,341	24,353	24,382
257	5,14	0,669	-1,207	24,317	24,341
258	5,16	0,752	-1,286	24,458	24,485
259	5,18	0,698	-1,310	24,200	24,227
260	5,20	0,711	-1,153	24,587	24,609
261	5,22	0,716	-1,362	24,317	24,346
262	5,24	0,694	-1,353	24,384	24,412
263	5,26	0,723	-1,236	24,562	24,587
264	5,28	0,727	-1,544	24,314	24,350
265	5,30	0,730	-1,148	24,356	24,378
266	5,32	0,700	-1,429	24,469	24,500
267	5,34	0,705	-1,245	24,441	24,467
268	5,36	0,752	-1,398	24,322	24,354
269	5,38	0,711	-1,148	24,470	24,492
270	5,40	0,748	-1,021	24,428	24,447
271	5,42	0,711	-1,462	24,475	24,508
272	5,44	0,697	-1,276	24,646	24,671
273	5,46	0,771	-1,280	24,445	24,472
274	5,48	0,685	-1,410	24,330	24,361
275	5,50	0,737	-1,043	24,427	24,446
276	5,52	0,764	-1,228	24,557	24,582
277	5,54	0,672	-1,201	24,519	24,543
278	5,56	0,735	-1,317	24,515	24,543
279	5,58	0,724	-1,342	24,309	24,337
280	5,60	0,706	-1,210	24,515	24,539
281	5,62	0,762	-1,311	24,369	24,397
282	5,64	0,678	-1,360	24,384	24,412
283	5,66	0,721	-0,997	24,623	24,641
284	5,68	0,734	-1,434	24,418	24,450
285	5,70	0,714	-1,165	24,385	24,408
286	5,72	0,688	-1,467	24,510	24,542
287	5,74	0,705	-1,289	24,468	24,494
288	5,76	0,732	-1,252	24,351	24,377
289	5,78	0,669	-1,186	24,382	24,404
290	5,80	0,700	-1,460	24,371	24,404
291	5,82	0,703	-1,277	24,436	24,462
292	5,84	0,714	-1,274	24,532	24,558
293	5,86	0,736	-1,345	24,371	24,400
294	5,88	0,725	-1,326	24,419	24,447
295	5,90	0,679	-1,357	24,288	24,316
296	5,92	0,711	-1,654	24,133	24,174
297	5,94	0,705	-1,283	24,455	24,481
298	5,96	0,698	-1,403	24,420	24,451
299	5,98	0,745	-1,413	24,415	24,447
300	6,00	0,702	-1,237	24,382	24,406



Berdasarkan grafik diatas, nilai tahanan model kapal tanpa *bulbous bow* terjadi pada waktu 3,5 – 4,0 s. Sehingga apabila dirata – ratakan nilai tahanan model kapal 1,522 N.

- Kecepatan 0,732 m/s

Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	0,229	-3,372	-0,483	2,411
1	0,02	4,937	22,525	41,940	44,826
2	0,04	4,641	10,285	52,583	53,101
3	0,06	5,797	-1,914	20,353	20,427
4	0,08	5,901	-6,188	35,544	35,815
5	0,10	6,166	8,130	29,103	29,688
6	0,12	6,302	-3,832	24,491	24,649
7	0,14	6,610	-9,071	31,077	31,732
8	0,16	6,501	0,800	10,150	10,196
9	0,18	6,960	-1,679	14,695	14,759
10	0,20	7,040	-11,622	29,765	30,870
11	0,22	7,324	-2,144	13,328	13,433
12	0,24	7,737	-5,360	15,008	15,489
13	0,26	7,560	-4,322	28,779	28,950
14	0,28	7,792	-2,763	21,347	21,444
15	0,30	7,956	-5,480	28,515	28,776
16	0,32	7,489	-1,464	34,834	34,853
17	0,34	7,276	-0,712	26,796	26,811
18	0,36	7,086	-0,799	36,542	36,553
19	0,38	7,064	-1,114	35,613	35,630
20	0,40	6,888	-1,551	22,537	22,574
21	0,42	6,592	-1,478	33,185	33,210
22	0,44	6,606	-0,913	26,918	26,934
23	0,46	6,384	-0,135	18,966	18,975
24	0,48	6,055	0,512	28,531	28,541
25	0,50	5,897	0,939	19,801	19,820
26	0,52	5,122	0,862	20,096	20,116
27	0,54	5,275	1,998	25,767	25,813
28	0,56	5,293	1,829	17,540	17,593
29	0,58	5,034	0,816	21,095	21,108
30	0,60	4,813	0,774	23,887	23,898
31	0,62	4,964	-0,626	17,925	17,938
32	0,64	4,865	-0,727	23,933	23,947
33	0,66	4,715	-0,819	24,263	24,279
34	0,68	4,365	-1,313	20,340	20,369
35	0,70	4,180	-0,872	26,362	26,376
36	0,72	3,735	-0,658	24,473	24,484
37	0,74	3,486	-0,640	23,223	23,234
38	0,76	3,325	-0,233	27,534	27,539
39	0,78	2,690	-0,431	24,562	24,568
40	0,80	2,705	-0,525	23,889	23,896
41	0,82	2,589	-0,114	27,004	27,007
42	0,84	2,418	-0,370	22,686	22,693
43	0,86	2,004	-0,573	23,731	23,738
44	0,88	2,130	-0,631	25,517	25,525
45	0,90	1,984	-0,724	21,574	21,584
46	0,92	1,840	-0,752	24,766	24,776
47	0,94	1,693	-0,571	25,235	25,243
48	0,96	1,576	-0,850	21,478	21,491
49	0,98	1,495	-0,198	25,818	25,823
50	1,00	1,221	0,038	24,124	24,129

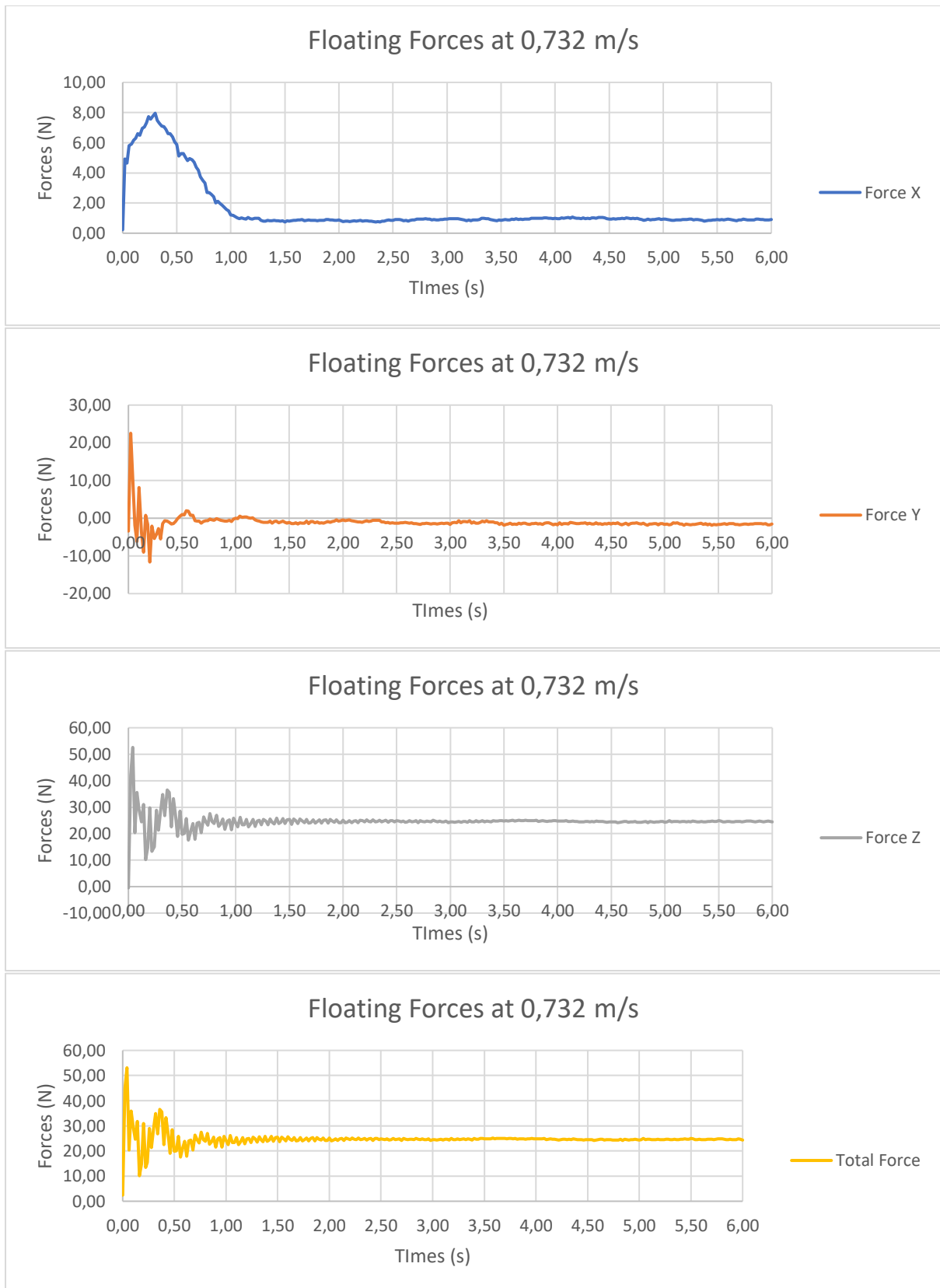
51	1,02	1,184	-0,128	22,513	22,519
52	1,04	1,097	0,505	26,172	26,179
53	1,06	1,028	0,204	23,280	23,285
54	1,08	0,968	0,330	23,362	23,368
55	1,10	1,004	0,280	25,371	25,377
56	1,12	0,949	0,141	22,569	22,574
57	1,14	0,923	0,013	23,698	23,702
58	1,16	1,049	0,067	25,379	25,384
59	1,18	0,955	-0,455	22,771	22,778
60	1,20	0,941	-0,675	24,806	24,815
61	1,22	0,989	-0,757	25,042	25,053
62	1,24	0,981	-1,022	23,276	23,293
63	1,26	0,983	-1,072	25,437	25,452
64	1,28	0,844	-1,144	24,753	24,771
65	1,30	0,807	-1,068	23,424	23,442
66	1,32	0,805	-0,776	25,570	25,581
67	1,34	0,844	-1,305	24,334	24,357
68	1,36	0,834	-0,852	23,615	23,629
69	1,38	0,835	-0,797	25,793	25,805
70	1,40	0,851	-1,189	23,838	23,859
71	1,42	0,835	-1,021	24,270	24,287
72	1,44	0,830	-0,752	25,773	25,784
73	1,46	0,802	-1,097	23,804	23,822
74	1,48	0,815	-1,356	25,256	25,279
75	1,50	0,747	-1,118	25,419	25,435
76	1,52	0,830	-1,449	23,574	23,601
77	1,54	0,808	-1,428	25,509	25,534
78	1,56	0,827	-1,196	24,862	24,881
79	1,58	0,849	-1,490	23,894	23,923
80	1,60	0,848	-1,195	25,603	25,623
81	1,62	0,886	-1,373	24,689	24,715
82	1,64	0,876	-1,338	24,089	24,114
83	1,66	0,895	-0,788	25,327	25,340
84	1,68	0,836	-1,412	23,946	23,973
85	1,70	0,854	-0,908	24,082	24,097
86	1,72	0,867	-0,839	25,229	25,242
87	1,74	0,846	-1,191	23,948	23,969
88	1,76	0,844	-0,984	24,546	24,562
89	1,78	0,861	-1,291	25,200	25,222
90	1,80	0,811	-1,209	23,990	24,011
91	1,82	0,850	-1,333	25,003	25,027
92	1,84	0,852	-1,108	25,249	25,267
93	1,86	0,855	-0,932	23,950	23,965
94	1,88	0,897	-1,083	25,364	25,382
95	1,90	0,894	-0,836	24,699	24,713
96	1,92	0,867	-0,790	24,288	24,301
97	1,94	0,891	-0,482	25,160	25,168
98	1,96	0,841	-0,726	24,146	24,158
99	1,98	0,858	-0,642	24,161	24,172
100	2,00	0,867	-0,399	25,079	25,087

101	2,02	0,834	-0,627	24,065	24,075
102	2,04	0,777	-0,545	24,330	24,338
103	2,06	0,784	-0,477	24,867	24,874
104	2,08	0,789	-0,686	24,128	24,138
105	2,10	0,776	-0,780	24,800	24,811
106	2,12	0,799	-0,906	24,947	24,960
107	2,14	0,815	-1,035	24,119	24,136
108	2,16	0,806	-1,008	25,082	25,097
109	2,18	0,824	-1,063	24,887	24,904
110	2,20	0,842	-0,864	24,482	24,495
111	2,22	0,797	-0,699	25,211	25,221
112	2,24	0,817	-0,888	24,620	24,633
113	2,26	0,819	-0,728	24,498	24,509
114	2,28	0,798	-0,521	25,183	25,190
115	2,30	0,811	-0,576	24,516	24,525
116	2,32	0,779	-0,570	24,578	24,586
117	2,34	0,738	-0,560	25,062	25,069
118	2,36	0,771	-0,961	24,375	24,389
119	2,38	0,754	-0,981	24,810	24,824
120	2,40	0,799	-1,230	25,043	25,063
121	2,42	0,803	-1,141	24,214	24,233
122	2,44	0,855	-1,362	24,897	24,922
123	2,46	0,876	-1,175	24,981	25,001
124	2,48	0,852	-1,366	24,438	24,463
125	2,50	0,852	-1,295	24,882	24,905
126	2,52	0,898	-1,346	24,701	24,726
127	2,54	0,910	-1,175	24,425	24,446
128	2,56	0,894	-1,240	24,811	24,833
129	2,58	0,870	-1,114	24,297	24,316
130	2,60	0,836	-1,261	24,459	24,481
131	2,62	0,844	-1,275	24,950	24,972
132	2,64	0,798	-1,247	24,467	24,488
133	2,66	0,840	-1,419	24,648	24,674
134	2,68	0,887	-1,406	24,863	24,889
135	2,70	0,893	-1,497	24,189	24,219
136	2,72	0,947	-1,647	24,898	24,933
137	2,74	0,939	-1,468	24,636	24,664
138	2,76	0,940	-1,390	24,395	24,422
139	2,78	0,939	-1,354	24,686	24,712
140	2,80	0,958	-1,436	24,574	24,602
141	2,82	0,946	-1,586	24,422	24,455
142	2,84	0,941	-1,416	24,997	25,024
143	2,86	0,890	-1,467	24,700	24,728
144	2,88	0,906	-1,502	24,403	24,433
145	2,90	0,893	-1,419	24,831	24,858
146	2,92	0,874	-1,330	24,469	24,493
147	2,94	0,898	-1,411	24,502	24,529
148	2,96	0,901	-1,344	24,839	24,864
149	2,98	0,930	-1,315	24,116	24,141
150	3,00	0,925	-1,621	24,517	24,550

151	3,02	0,954	-1,264	24,514	24,538
152	3,04	0,964	-1,120	24,310	24,331
153	3,06	0,972	-1,221	24,506	24,528
154	3,08	0,950	-0,690	24,578	24,591
155	3,10	0,953	-1,203	24,241	24,263
156	3,12	0,939	-0,935	24,578	24,594
157	3,14	0,905	-0,918	24,568	24,584
158	3,16	0,880	-1,026	24,317	24,334
159	3,18	0,836	-0,669	24,935	24,945
160	3,20	0,888	-1,325	24,425	24,449
161	3,22	0,836	-0,946	24,435	24,450
162	3,24	0,876	-1,369	24,865	24,890
163	3,26	0,885	-1,281	24,404	24,427
164	3,28	0,892	-1,121	24,614	24,633
165	3,30	0,911	-0,738	24,885	24,898
166	3,32	0,985	-0,980	24,497	24,515
167	3,34	0,978	-0,707	24,755	24,768
168	3,36	0,958	-1,013	24,574	24,592
169	3,38	0,955	-0,985	24,378	24,396
170	3,40	0,912	-1,047	24,896	24,914
171	3,42	0,880	-1,253	24,687	24,709
172	3,44	0,865	-1,186	24,708	24,729
173	3,46	0,820	-1,649	24,889	24,922
174	3,48	0,868	-1,281	24,890	24,912
175	3,50	0,857	-1,895	24,739	24,781
176	3,52	0,878	-1,655	24,844	24,877
177	3,54	0,900	-1,586	24,741	24,773
178	3,56	0,894	-1,367	24,869	24,895
179	3,58	0,888	-1,617	25,128	25,160
180	3,60	0,923	-1,594	24,747	24,779
181	3,62	0,894	-1,618	24,939	24,971
182	3,64	0,953	-1,316	25,025	25,050
183	3,66	0,896	-1,528	24,899	24,928
184	3,68	0,942	-1,322	24,970	24,994
185	3,70	0,919	-1,340	25,020	25,045
186	3,72	0,926	-1,497	24,861	24,890
187	3,74	0,935	-1,615	24,959	24,992
188	3,76	0,927	-1,378	24,920	24,946
189	3,78	0,978	-1,483	24,847	24,877
190	3,80	0,989	-1,371	25,046	25,073
191	3,82	0,976	-1,551	24,611	24,643
192	3,84	0,980	-1,458	24,816	24,845
193	3,86	0,986	-1,697	24,861	24,897
194	3,88	0,999	-1,296	24,730	24,755
195	3,90	1,018	-1,240	24,663	24,687
196	3,92	1,018	-1,243	24,818	24,842
197	3,94	0,983	-1,407	24,814	24,842
198	3,96	0,994	-1,757	24,880	24,919
199	3,98	0,973	-1,504	24,860	24,890
200	4,00	0,979	-1,709	24,714	24,751

201	4,02	0,958	-1,230	24,757	24,779
202	4,04	0,970	-1,644	24,763	24,798
203	4,06	1,019	-1,428	24,720	24,749
204	4,08	0,990	-1,473	24,894	24,923
205	4,10	1,025	-1,536	24,529	24,562
206	4,12	1,032	-1,090	24,663	24,683
207	4,14	0,977	-1,223	24,737	24,760
208	4,16	1,059	-1,318	24,642	24,669
209	4,18	1,016	-1,433	24,618	24,647
210	4,20	0,978	-1,438	24,427	24,456
211	4,22	1,001	-1,342	24,385	24,412
212	4,24	0,965	-1,292	24,454	24,478
213	4,26	1,014	-1,162	24,674	24,696
214	4,28	0,958	-1,488	24,550	24,580
215	4,30	0,990	-1,290	24,518	24,543
216	4,32	0,964	-1,510	24,550	24,580
217	4,34	1,005	-1,521	24,454	24,486
218	4,36	1,024	-1,249	24,807	24,832
219	4,38	0,999	-1,509	24,647	24,678
220	4,40	1,034	-1,440	24,546	24,576
221	4,42	1,042	-1,622	24,541	24,576
222	4,44	1,035	-1,487	24,388	24,419
223	4,46	1,015	-1,547	24,322	24,355
224	4,48	0,963	-1,289	24,418	24,443
225	4,50	0,928	-1,561	24,402	24,434
226	4,52	0,944	-1,353	24,509	24,535
227	4,54	0,962	-1,457	24,423	24,452
228	4,56	0,943	-1,246	24,183	24,206
229	4,58	0,973	-1,550	24,244	24,277
230	4,60	0,950	-1,806	24,487	24,527
231	4,62	0,986	-1,557	24,601	24,633
232	4,64	0,970	-1,341	24,603	24,629
233	4,66	1,017	-1,787	24,298	24,339
234	4,68	0,992	-1,425	24,409	24,438
235	4,70	0,953	-1,377	24,505	24,532
236	4,72	0,984	-1,355	24,534	24,561
237	4,74	0,956	-1,229	24,296	24,319
238	4,76	0,997	-1,416	24,303	24,332
239	4,78	0,928	-1,499	24,247	24,277
240	4,80	0,913	-1,374	24,376	24,402
241	4,82	0,860	-1,600	24,582	24,614
242	4,84	0,878	-1,831	24,171	24,212
243	4,86	0,928	-1,518	24,553	24,583
244	4,88	0,890	-1,549	24,515	24,545
245	4,90	0,914	-1,396	24,345	24,372
246	4,92	0,894	-1,404	24,468	24,495
247	4,94	0,936	-1,736	24,393	24,430
248	4,96	0,953	-1,458	24,564	24,593
249	4,98	0,913	-1,487	24,530	24,559
250	5,00	0,927	-1,654	24,366	24,401

251	5,02	0,945	-1,517	24,405	24,436
252	5,04	0,899	-1,770	24,876	24,914
253	5,06	0,869	-1,656	24,490	24,524
254	5,08	0,856	-1,243	24,592	24,614
255	5,10	0,843	-1,360	24,568	24,593
256	5,12	0,888	-1,229	24,532	24,553
257	5,14	0,881	-1,547	24,432	24,462
258	5,16	0,881	-1,585	24,527	24,559
259	5,18	0,909	-1,909	24,629	24,673
260	5,20	0,903	-1,560	24,493	24,524
261	5,22	0,903	-1,605	24,542	24,575
262	5,24	0,938	-1,733	24,470	24,507
263	5,26	0,936	-1,622	24,689	24,723
264	5,28	0,891	-1,667	24,662	24,697
265	5,30	0,895	-1,556	24,508	24,539
266	5,32	0,913	-1,482	24,517	24,546
267	5,34	0,875	-1,373	24,601	24,626
268	5,36	0,857	-1,668	24,479	24,513
269	5,38	0,810	-1,391	24,444	24,469
270	5,40	0,812	-1,735	24,618	24,653
271	5,42	0,854	-1,549	24,619	24,649
272	5,44	0,855	-1,927	24,745	24,787
273	5,46	0,870	-1,609	24,625	24,657
274	5,48	0,880	-1,787	24,656	24,695
275	5,50	0,898	-1,621	24,994	25,027
276	5,52	0,879	-1,643	24,753	24,786
277	5,54	0,904	-1,586	24,524	24,556
278	5,56	0,890	-1,426	24,447	24,474
279	5,58	0,912	-1,659	24,626	24,661
280	5,60	0,944	-1,479	24,547	24,576
281	5,62	0,899	-1,482	24,433	24,462
282	5,64	0,880	-1,458	24,403	24,431
283	5,66	0,842	-1,678	24,578	24,612
284	5,68	0,830	-1,681	24,660	24,694
285	5,70	0,891	-1,732	24,590	24,627
286	5,72	0,890	-1,682	24,517	24,552
287	5,74	0,931	-1,524	24,592	24,622
288	5,76	0,905	-1,504	24,767	24,797
289	5,78	0,877	-1,621	24,731	24,763
290	5,80	0,870	-1,585	24,815	24,846
291	5,82	0,867	-1,536	24,563	24,593
292	5,84	0,890	-1,418	24,510	24,537
293	5,86	0,932	-1,394	24,552	24,579
294	5,88	0,946	-1,417	24,711	24,738
295	5,90	0,915	-1,392	24,551	24,577
296	5,92	0,919	-1,500	24,392	24,422
297	5,94	0,890	-1,446	24,545	24,573
298	5,96	0,886	-1,711	24,733	24,769
299	5,98	0,888	-1,816	24,583	24,622
300	6,00	0,904	-1,564	24,372	24,403



Berdasarkan grafik diatas, nilai tahanan model kapal tanpa *bulbous bow* terjadi pada waktu 4,5 – 5,0 s. Sehingga apabila dirata – ratakan nilai tahanan model kapal 1,884 N.

- Kecepatan 0,813 m/s

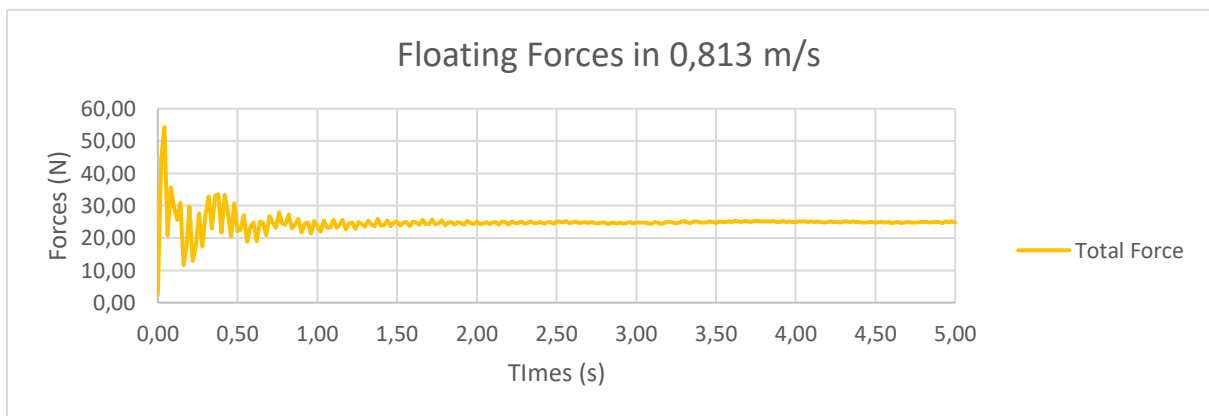
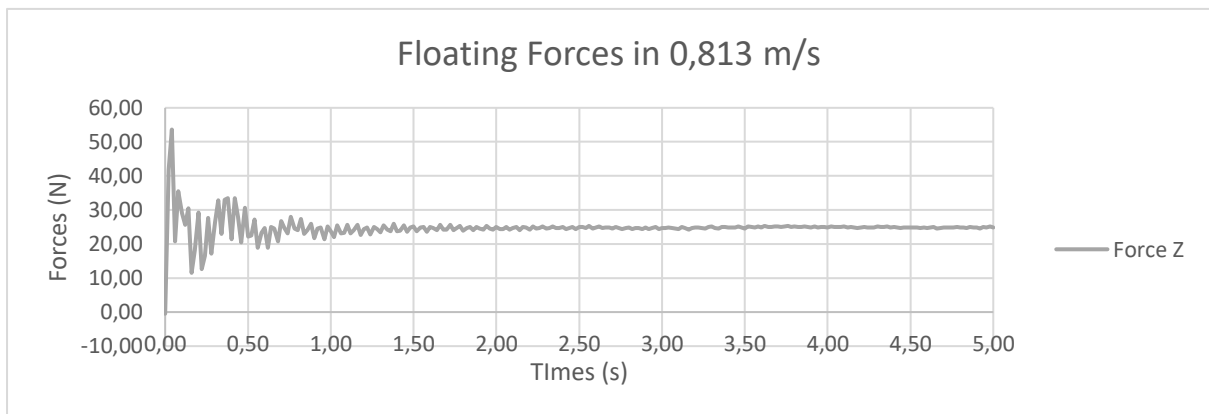
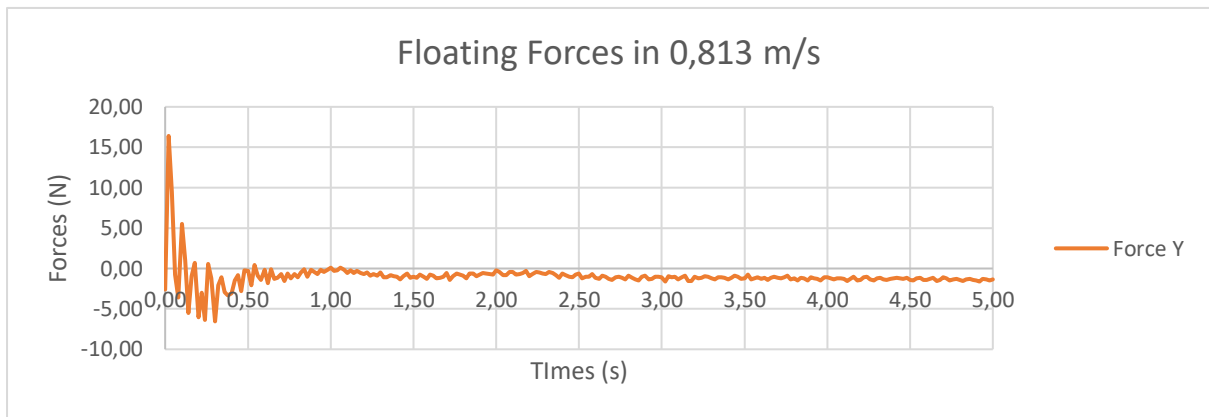
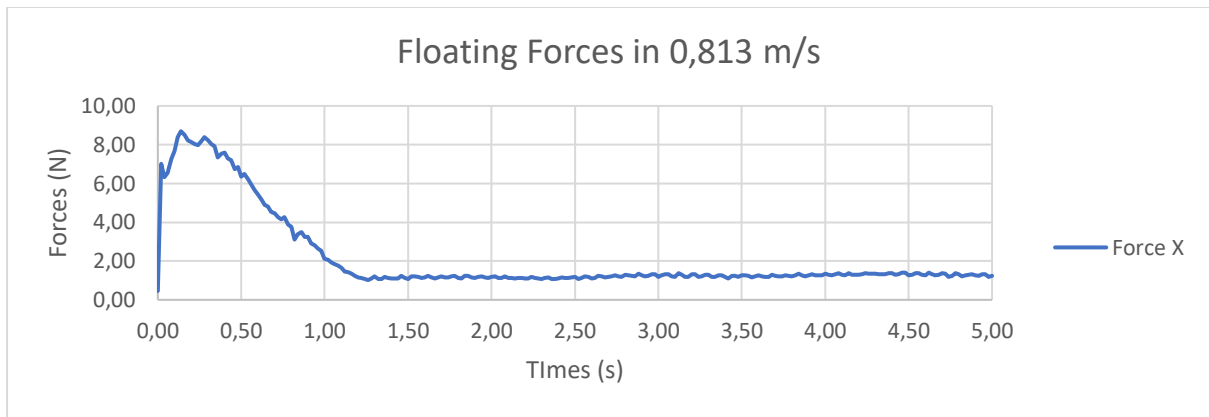
Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	0,459	-2,623	-0,483	2,411
1	0,02	7,001	16,403	41,715	44,272
2	0,04	6,331	9,470	53,623	54,329
3	0,06	6,549	-0,741	20,754	20,806
4	0,08	7,268	-3,618	35,443	35,605
5	0,10	7,669	5,530	29,131	29,597
6	0,12	8,377	0,997	25,602	25,638
7	0,14	8,695	-5,523	30,518	30,936
8	0,16	8,493	-0,954	11,468	11,528
9	0,18	8,214	0,716	18,083	18,112
10	0,20	8,149	-6,005	29,176	29,695
11	0,22	8,044	-3,033	12,636	12,950
12	0,24	7,988	-6,355	16,480	17,457
13	0,26	8,171	0,537	27,644	27,666
14	0,28	8,385	-1,234	17,219	17,280
15	0,30	8,224	-6,545	26,398	27,053
16	0,32	8,021	-2,086	32,773	32,832
17	0,34	7,917	-1,113	22,974	23,017
18	0,36	7,350	-2,920	32,929	33,050
19	0,38	7,524	-3,320	33,396	33,543
20	0,40	7,588	-3,066	21,460	21,653
21	0,42	7,287	-1,484	33,406	33,447
22	0,44	7,208	-0,819	27,915	27,943
23	0,46	6,749	-2,777	20,378	20,547
24	0,48	6,849	-0,212	30,649	30,661
25	0,50	6,345	-0,269	22,168	22,180
26	0,52	6,500	-2,065	22,538	22,626
27	0,54	6,207	0,438	27,161	27,172
28	0,56	5,942	-0,860	18,877	18,901
29	0,58	5,672	-1,411	23,271	23,313
30	0,60	5,439	-0,158	24,744	24,752
31	0,62	5,161	-1,823	18,957	19,038
32	0,64	4,902	-0,116	25,032	25,041
33	0,66	4,802	-1,280	24,530	24,568
34	0,68	4,543	-1,129	20,825	20,861
35	0,70	4,467	-0,691	26,774	26,790
36	0,72	4,276	-1,518	24,669	24,715
37	0,74	4,141	-0,618	23,195	23,212
38	0,76	4,254	-1,238	27,905	27,934
39	0,78	3,883	-0,666	24,518	24,533
40	0,80	3,758	-1,100	24,122	24,150
41	0,82	3,100	-0,520	27,280	27,291
42	0,84	3,371	-0,082	22,978	22,988
43	0,86	3,502	-1,034	24,091	24,115
44	0,88	3,249	-0,184	25,860	25,868
45	0,90	3,242	-0,395	21,692	21,705
46	0,92	2,915	-0,674	24,512	24,528
47	0,94	2,799	-0,131	24,814	24,822
48	0,96	2,647	-0,445	21,379	21,391
49	0,98	2,523	-0,180	25,206	25,214
50	1,00	2,128	0,081	23,680	23,688

51	1,02	2,074	-0,296	22,055	22,065
52	1,04	1,923	-0,257	25,515	25,523
53	1,06	1,845	0,114	23,080	23,089
54	1,08	1,761	-0,189	23,301	23,310
55	1,10	1,644	-0,560	25,645	25,658
56	1,12	1,469	-0,257	23,151	23,160
57	1,14	1,440	-0,554	24,014	24,027
58	1,16	1,348	-0,278	25,636	25,645
59	1,18	1,234	-0,589	22,704	22,718
60	1,20	1,144	-0,667	24,386	24,402
61	1,22	1,130	-0,474	24,773	24,785
62	1,24	1,084	-0,891	22,757	22,779
63	1,26	1,026	-0,717	24,998	25,013
64	1,28	1,109	-0,916	24,335	24,357
65	1,30	1,206	-0,474	23,373	23,386
66	1,32	1,072	-1,091	25,462	25,488
67	1,34	1,059	-1,063	24,140	24,166
68	1,36	1,179	-0,847	23,690	23,712
69	1,38	1,139	-0,975	25,946	25,968
70	1,40	1,088	-1,036	23,727	23,753
71	1,42	1,097	-1,358	23,877	23,917
72	1,44	1,103	-0,925	25,445	25,466
73	1,46	1,224	-0,596	23,665	23,681
74	1,48	1,127	-1,151	24,830	24,860
75	1,50	1,084	-1,043	25,116	25,141
76	1,52	1,207	-1,151	23,785	23,817
77	1,54	1,212	-0,741	24,795	24,813
78	1,56	1,178	-1,014	24,999	25,024
79	1,58	1,114	-1,252	23,610	23,645
80	1,60	1,161	-0,754	25,061	25,079
81	1,62	1,232	-0,915	24,684	24,707
82	1,64	1,168	-1,210	24,021	24,054
83	1,66	1,100	-1,130	25,598	25,626
84	1,68	1,166	-1,010	24,291	24,317
85	1,70	1,207	-0,584	24,289	24,304
86	1,72	1,165	-1,396	25,681	25,720
87	1,74	1,151	-0,982	24,093	24,118
88	1,76	1,207	-0,641	24,625	24,641
89	1,78	1,248	-0,761	25,385	25,404
90	1,80	1,141	-0,897	23,897	23,919
91	1,82	1,106	-1,247	24,710	24,743
92	1,84	1,239	-0,637	24,992	25,009
93	1,86	1,245	-0,598	24,045	24,061
94	1,88	1,165	-0,934	24,966	24,989
95	1,90	1,121	-0,763	24,549	24,567
96	1,92	1,169	-0,541	24,141	24,155
97	1,94	1,207	-0,603	25,250	25,265
98	1,96	1,143	-0,668	24,548	24,564
99	1,98	1,118	-0,781	24,204	24,222
100	2,00	1,193	-0,238	25,065	25,075

101	2,02	1,216	-0,454	24,339	24,352
102	2,04	1,119	-0,814	24,425	24,444
103	2,06	1,125	-0,833	24,959	24,978
104	2,08	1,215	-0,426	24,259	24,272
105	2,10	1,133	-0,438	24,746	24,757
106	2,12	1,140	-0,785	24,956	24,974
107	2,14	1,102	-0,689	24,123	24,138
108	2,16	1,119	-0,584	25,040	25,053
109	2,18	1,140	-0,293	24,894	24,904
110	2,20	1,101	-0,956	24,181	24,204
111	2,22	1,093	-0,723	25,137	25,153
112	2,24	1,174	-0,422	24,588	24,600
113	2,26	1,124	-0,476	24,630	24,642
114	2,28	1,092	-0,600	25,179	25,192
115	2,30	1,084	-0,718	24,459	24,475
116	2,32	1,125	-0,421	24,682	24,693
117	2,34	1,162	-0,541	25,157	25,170
118	2,36	1,080	-0,834	24,658	24,677
119	2,38	1,085	-1,157	24,647	24,676
120	2,40	1,107	-0,619	24,951	24,965
121	2,42	1,145	-0,826	24,433	24,453
122	2,44	1,123	-1,041	24,753	24,779
123	2,46	1,119	-1,077	24,960	24,987
124	2,48	1,150	-0,752	24,448	24,466
125	2,50	1,189	-0,647	24,984	24,999
126	2,52	1,075	-1,206	25,014	25,045
127	2,54	1,135	-1,016	24,735	24,760
128	2,56	1,217	-0,988	25,271	25,296
129	2,58	1,179	-0,694	24,602	24,619
130	2,60	1,103	-1,133	24,767	24,795
131	2,62	1,114	-1,274	25,085	25,119
132	2,64	1,235	-0,871	24,626	24,648
133	2,66	1,220	-0,997	24,791	24,817
134	2,68	1,153	-1,296	24,891	24,927
135	2,70	1,193	-1,435	24,535	24,578
136	2,72	1,212	-1,077	24,933	24,961
137	2,74	1,251	-1,034	24,660	24,687
138	2,76	1,218	-1,124	24,418	24,449
139	2,78	1,184	-1,343	24,669	24,708
140	2,80	1,280	-0,859	24,814	24,837
141	2,82	1,277	-1,145	24,311	24,343
142	2,84	1,234	-1,366	24,611	24,651
143	2,86	1,209	-1,470	24,698	24,743
144	2,88	1,341	-1,027	24,412	24,441
145	2,90	1,261	-0,870	24,780	24,802
146	2,92	1,205	-1,354	24,433	24,473
147	2,94	1,247	-1,271	24,667	24,703
148	2,96	1,309	-1,022	24,995	25,022
149	2,98	1,319	-1,012	24,441	24,469
150	3,00	1,193	-1,101	24,722	24,751

151	3,02	1,274	-1,618	24,726	24,779
152	3,04	1,321	-0,956	24,810	24,836
153	3,06	1,333	-1,083	24,726	24,756
154	3,08	1,212	-1,053	24,462	24,490
155	3,10	1,184	-1,351	24,406	24,445
156	3,12	1,373	-1,109	24,957	24,989
157	3,14	1,280	-0,911	24,658	24,682
158	3,16	1,193	-1,517	24,250	24,297
159	3,18	1,189	-1,580	24,709	24,759
160	3,20	1,317	-1,001	24,892	24,920
161	3,22	1,323	-1,221	24,888	24,923
162	3,24	1,176	-1,167	24,609	24,640
163	3,26	1,207	-0,941	24,587	24,611
164	3,28	1,306	-1,045	24,959	24,987
165	3,30	1,293	-1,240	25,219	25,254
166	3,32	1,174	-1,372	24,688	24,728
167	3,34	1,191	-1,091	24,601	24,629
168	3,36	1,276	-1,086	25,048	25,077
169	3,38	1,264	-1,155	25,060	25,092
170	3,40	1,187	-1,365	24,808	24,847
171	3,42	1,109	-1,177	24,797	24,827
172	3,44	1,231	-0,860	24,790	24,811
173	3,46	1,248	-1,048	25,109	25,136
174	3,48	1,183	-1,306	24,850	24,886
175	3,50	1,261	-1,208	24,517	24,551
176	3,52	1,254	-0,752	25,095	25,114
177	3,54	1,249	-1,368	24,965	25,005
178	3,56	1,153	-1,224	24,840	24,873
179	3,58	1,210	-1,088	25,120	25,148
180	3,60	1,269	-1,289	24,879	24,916
181	3,62	1,210	-1,120	25,274	25,303
182	3,64	1,191	-1,396	25,017	25,057
183	3,66	1,177	-1,136	25,005	25,034
184	3,68	1,288	-1,039	25,208	25,236
185	3,70	1,245	-1,167	25,150	25,181
186	3,72	1,207	-1,240	24,944	24,979
187	3,74	1,214	-1,086	25,196	25,224
188	3,76	1,266	-0,912	25,291	25,314
189	3,78	1,247	-1,384	25,019	25,060
190	3,80	1,215	-1,236	25,156	25,190
191	3,82	1,268	-1,512	25,060	25,107
192	3,84	1,342	-1,154	25,066	25,099
193	3,86	1,271	-1,228	25,229	25,263
194	3,88	1,202	-1,468	24,971	25,015
195	3,90	1,255	-1,096	24,893	24,923
196	3,92	1,315	-1,233	25,196	25,231
197	3,94	1,267	-1,272	24,897	24,933
198	3,96	1,265	-1,505	25,032	25,078
199	3,98	1,268	-1,119	25,001	25,031
200	4,00	1,348	-1,076	24,895	24,925

201	4,02	1,288	-1,206	25,087	25,121
202	4,04	1,274	-1,366	25,023	25,064
203	4,06	1,322	-1,189	25,034	25,068
204	4,08	1,377	-1,201	24,986	25,021
205	4,10	1,306	-1,260	25,123	25,159
206	4,12	1,278	-1,547	24,904	24,953
207	4,14	1,365	-1,298	25,038	25,077
208	4,16	1,289	-1,051	24,888	24,917
209	4,18	1,305	-1,454	24,720	24,765
210	4,20	1,304	-1,448	24,917	24,961
211	4,22	1,328	-1,104	25,062	25,092
212	4,24	1,376	-1,050	24,892	24,922
213	4,26	1,355	-1,376	24,872	24,914
214	4,28	1,335	-1,456	24,804	24,850
215	4,30	1,336	-1,194	25,078	25,112
216	4,32	1,333	-1,164	25,065	25,098
217	4,34	1,315	-1,379	24,975	25,016
218	4,36	1,328	-1,392	25,076	25,118
219	4,38	1,378	-1,287	24,846	24,885
220	4,40	1,369	-1,203	24,965	25,001
221	4,42	1,293	-1,171	24,803	24,836
222	4,44	1,332	-1,191	24,753	24,787
223	4,46	1,393	-1,316	24,880	24,920
224	4,48	1,392	-1,179	24,845	24,880
225	4,50	1,273	-1,410	24,804	24,847
226	4,52	1,306	-1,501	24,867	24,915
227	4,54	1,376	-1,250	24,886	24,923
228	4,56	1,373	-1,152	24,710	24,744
229	4,58	1,282	-1,425	24,868	24,911
230	4,60	1,267	-1,397	24,664	24,706
231	4,62	1,392	-1,293	24,823	24,862
232	4,64	1,328	-1,124	24,981	25,012
233	4,66	1,278	-1,522	24,589	24,637
234	4,68	1,299	-1,388	24,689	24,731
235	4,70	1,373	-1,108	24,866	24,898
236	4,72	1,339	-1,230	24,804	24,839
237	4,74	1,196	-1,476	24,766	24,811
238	4,76	1,230	-1,359	24,793	24,832
239	4,78	1,366	-1,258	24,957	24,994
240	4,80	1,327	-1,429	24,914	24,958
241	4,82	1,221	-1,526	24,868	24,915
242	4,84	1,278	-1,378	24,666	24,708
243	4,86	1,297	-1,274	24,923	24,960
244	4,88	1,317	-1,403	24,903	24,946
245	4,90	1,257	-1,475	24,840	24,885
246	4,92	1,243	-1,590	24,570	24,621
247	4,94	1,307	-1,304	25,010	25,049
248	4,96	1,307	-1,370	24,883	24,924
249	4,98	1,177	-1,464	25,131	25,174
250	5,00	1,236	-1,381	24,795	24,836



Berdasarkan grafik diatas, nilai tahanan model kapal tanpa *bulbous bow* terjadi pada waktu 2,0 – 2,5 s. Sehingga apabila dirata – ratakan nilai tahanan model kapal 2,266 N.

- Kecepatan 0,894 m/s

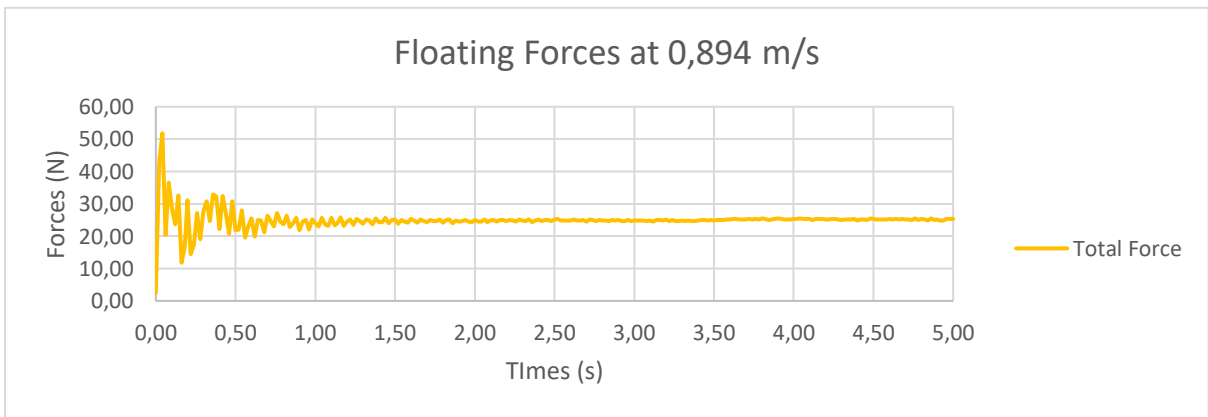
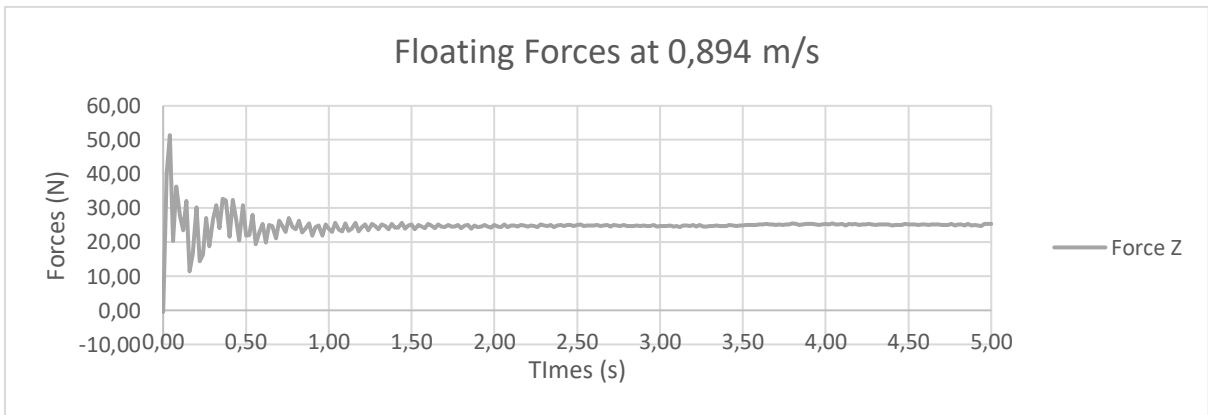
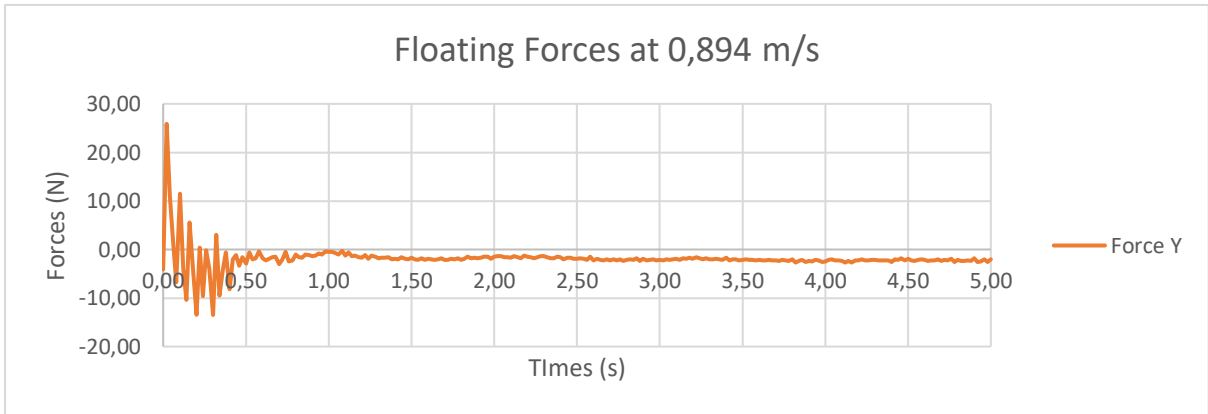
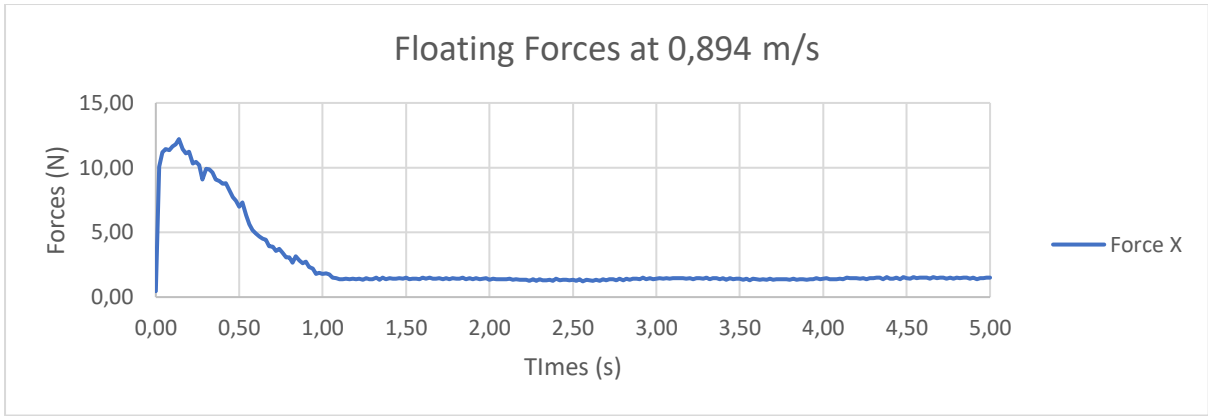
Part	Time [s]	ForceTotal.x [N]	ForceTotal.y [N]	ForceTotal.z [N]	ForceTotal [N]
0	0,00	0,459	-4,141	-0,483	2,411
1	0,02	10,070	25,882	40,119	42,772
2	0,04	11,202	11,060	51,383	51,817
3	0,06	11,438	1,728	20,325	20,403
4	0,08	11,342	-6,721	36,333	36,556
5	0,10	11,655	11,528	27,687	28,525
6	0,12	11,803	-3,739	23,535	23,661
7	0,14	12,206	-10,332	32,093	32,652
8	0,16	11,424	5,589	11,377	11,882
9	0,18	11,086	-3,501	16,539	16,689
10	0,20	11,231	-13,490	30,166	31,151
11	0,22	10,303	0,392	14,377	14,409
12	0,24	10,459	-9,661	16,271	17,209
13	0,26	10,212	-0,182	27,094	27,121
14	0,28	9,102	-4,058	18,861	19,024
15	0,30	9,898	-13,492	26,691	27,794
16	0,32	9,862	3,038	30,783	30,847
17	0,34	9,622	-9,548	24,044	24,679
18	0,36	9,073	-4,466	32,715	32,838
19	0,38	8,982	-0,642	32,199	32,222
20	0,40	8,750	-8,170	21,677	22,206
21	0,42	8,791	-1,999	32,458	32,498
22	0,44	8,320	-1,104	26,921	26,954
23	0,46	7,712	-3,295	20,575	20,684
24	0,48	7,430	-1,617	30,771	30,805
25	0,50	6,970	-2,930	21,844	21,923
26	0,52	7,319	-0,636	22,081	22,104
27	0,54	6,307	-2,018	27,992	28,027
28	0,56	5,621	-1,790	19,470	19,510
29	0,58	5,170	-0,390	23,016	23,030
30	0,60	4,903	-1,807	25,388	25,421
31	0,62	4,657	-2,284	19,903	19,959
32	0,64	4,519	-1,880	24,998	25,037
33	0,66	4,416	-1,557	24,784	24,815
34	0,68	3,920	-1,513	21,114	21,146
35	0,70	3,909	-3,021	26,246	26,318
36	0,72	3,578	-1,991	24,663	24,703
37	0,74	3,711	-0,490	23,035	23,053
38	0,76	3,429	-2,428	27,138	27,187
39	0,78	3,085	-2,222	24,432	24,477
40	0,80	3,062	-1,073	23,739	23,762
41	0,82	2,663	-1,581	26,358	26,384
42	0,84	3,132	-1,669	22,823	22,859
43	0,86	2,841	-1,019	23,941	23,962
44	0,88	2,614	-1,141	25,578	25,598
45	0,90	2,746	-1,319	21,838	21,867
46	0,92	2,334	-1,253	24,444	24,467
47	0,94	2,206	-0,770	24,928	24,945
48	0,96	1,775	-1,015	21,953	21,974
49	0,98	1,863	-0,330	25,144	25,157
50	1,00	1,779	-0,508	24,009	24,023

51	1,02	1,817	-0,453	22,986	23,002
52	1,04	1,754	-0,658	25,654	25,668
53	1,06	1,499	-1,059	23,645	23,664
54	1,08	1,474	-0,240	23,175	23,190
55	1,10	1,363	-1,255	25,570	25,592
56	1,12	1,387	-0,623	23,337	23,353
57	1,14	1,407	-1,376	23,919	23,945
58	1,16	1,394	-1,228	25,729	25,751
59	1,18	1,408	-1,537	23,225	23,255
60	1,20	1,370	-1,710	24,405	24,437
61	1,22	1,406	-1,118	25,141	25,162
62	1,24	1,338	-1,930	23,402	23,440
63	1,26	1,460	-1,223	25,343	25,366
64	1,28	1,374	-1,499	24,724	24,751
65	1,30	1,399	-1,840	23,769	23,805
66	1,32	1,490	-1,679	25,175	25,207
67	1,34	1,343	-1,663	24,757	24,787
68	1,36	1,516	-1,574	23,721	23,754
69	1,38	1,376	-2,079	25,405	25,445
70	1,40	1,456	-1,898	24,335	24,373
71	1,42	1,429	-2,041	24,258	24,299
72	1,44	1,415	-1,623	25,708	25,737
73	1,46	1,475	-1,929	23,917	23,957
74	1,48	1,425	-2,043	24,927	24,967
75	1,50	1,505	-1,752	25,151	25,185
76	1,52	1,367	-1,988	23,815	23,854
77	1,54	1,411	-2,146	24,976	25,019
78	1,56	1,429	-1,802	24,548	24,583
79	1,58	1,373	-2,190	24,056	24,101
80	1,60	1,485	-1,894	25,322	25,359
81	1,62	1,410	-2,047	24,857	24,898
82	1,64	1,498	-2,131	24,053	24,098
83	1,66	1,426	-2,055	25,129	25,170
84	1,68	1,431	-1,848	24,575	24,611
85	1,70	1,465	-2,171	24,343	24,388
86	1,72	1,396	-2,125	24,982	25,024
87	1,74	1,470	-1,963	24,628	24,668
88	1,76	1,394	-2,004	24,618	24,658
89	1,78	1,480	-1,780	25,081	25,115
90	1,80	1,418	-2,172	24,063	24,108
91	1,82	1,412	-1,899	24,901	24,938
92	1,84	1,495	-1,474	25,112	25,141
93	1,86	1,397	-1,789	24,005	24,040
94	1,88	1,468	-1,714	24,835	24,869
95	1,90	1,362	-1,761	24,494	24,527
96	1,92	1,442	-1,665	24,602	24,634
97	1,94	1,380	-1,439	25,019	25,045
98	1,96	1,424	-1,488	24,557	24,585
99	1,98	1,454	-1,922	24,294	24,333
100	2,00	1,322	-1,515	25,001	25,028

101	2,02	1,401	-1,394	24,546	24,572
102	2,04	1,361	-1,420	24,486	24,512
103	2,06	1,396	-1,580	25,210	25,239
104	2,08	1,382	-1,627	24,351	24,382
105	2,10	1,363	-1,734	24,820	24,852
106	2,12	1,413	-1,393	24,912	24,938
107	2,14	1,337	-1,641	24,500	24,530
108	2,16	1,371	-1,761	25,015	25,047
109	2,18	1,322	-1,291	24,951	24,973
110	2,20	1,331	-1,432	24,576	24,602
111	2,22	1,337	-1,580	24,897	24,925
112	2,24	1,270	-1,776	24,771	24,802
113	2,26	1,391	-1,568	24,477	24,506
114	2,28	1,236	-1,339	25,143	25,164
115	2,30	1,363	-1,398	24,892	24,917
116	2,32	1,283	-1,552	24,694	24,721
117	2,34	1,280	-1,828	25,113	25,145
118	2,36	1,336	-1,796	24,344	24,378
119	2,38	1,250	-1,512	24,812	24,837
120	2,40	1,430	-1,576	25,075	25,104
121	2,42	1,278	-2,007	24,692	24,729
122	2,44	1,339	-1,648	24,979	25,008
123	2,46	1,336	-1,646	24,972	25,001
124	2,48	1,286	-1,906	24,666	24,700
125	2,50	1,346	-1,961	25,048	25,084
126	2,52	1,245	-1,776	25,250	25,280
127	2,54	1,361	-1,957	24,744	24,781
128	2,56	1,228	-2,133	24,825	24,865
129	2,58	1,336	-1,432	24,843	24,868
130	2,60	1,308	-2,247	24,872	24,916
131	2,62	1,272	-1,904	25,070	25,103
132	2,64	1,359	-2,183	24,765	24,808
133	2,66	1,272	-2,292	24,819	24,864
134	2,68	1,395	-2,069	25,036	25,077
135	2,70	1,307	-2,288	24,500	24,546
136	2,72	1,388	-1,983	25,049	25,087
137	2,74	1,361	-2,292	24,963	25,010
138	2,76	1,304	-2,078	24,715	24,754
139	2,78	1,404	-2,367	25,009	25,058
140	2,80	1,303	-2,106	24,807	24,847
141	2,82	1,428	-2,066	24,745	24,787
142	2,84	1,346	-2,172	24,679	24,722
143	2,86	1,408	-1,824	24,954	24,989
144	2,88	1,411	-2,381	24,790	24,840
145	2,90	1,366	-1,917	24,899	24,935
146	2,92	1,487	-2,215	24,660	24,707
147	2,94	1,394	-2,156	24,702	24,745
148	2,96	1,468	-2,069	24,986	25,027
149	2,98	1,382	-2,213	24,581	24,626
150	3,00	1,411	-2,116	24,794	24,836

151	3,02	1,456	-2,198	24,787	24,833
152	3,04	1,421	-2,030	24,802	24,842
153	3,06	1,443	-2,142	24,817	24,861
154	3,08	1,401	-2,028	24,592	24,632
155	3,10	1,463	-1,956	24,770	24,809
156	3,12	1,452	-2,119	24,425	24,469
157	3,14	1,443	-1,803	24,910	24,945
158	3,16	1,449	-1,954	24,912	24,950
159	3,18	1,409	-1,741	24,780	24,813
160	3,20	1,460	-1,911	25,057	25,094
161	3,22	1,367	-1,617	24,650	24,679
162	3,24	1,474	-1,852	25,026	25,062
163	3,26	1,475	-2,069	24,604	24,647
164	3,28	1,407	-1,772	24,609	24,643
165	3,30	1,523	-2,062	24,758	24,801
166	3,32	1,365	-2,031	24,710	24,749
167	3,34	1,472	-1,934	24,874	24,912
168	3,36	1,446	-2,029	24,695	24,735
169	3,38	1,397	-2,137	24,688	24,731
170	3,40	1,468	-1,651	24,734	24,766
171	3,42	1,353	-2,222	25,037	25,081
172	3,44	1,462	-1,995	24,942	24,982
173	3,46	1,389	-2,032	24,769	24,809
174	3,48	1,422	-2,195	24,928	24,973
175	3,50	1,410	-2,145	24,845	24,888
176	3,52	1,321	-2,066	25,000	25,039
177	3,54	1,421	-2,156	25,007	25,051
178	3,56	1,306	-2,154	24,994	25,035
179	3,58	1,422	-2,302	25,082	25,129
180	3,60	1,363	-2,127	25,167	25,208
181	3,62	1,353	-2,216	25,231	25,274
182	3,64	1,377	-2,206	25,324	25,367
183	3,66	1,332	-2,185	25,135	25,177
184	3,68	1,408	-2,197	25,178	25,222
185	3,70	1,325	-2,199	25,076	25,119
186	3,72	1,374	-2,351	25,258	25,305
187	3,74	1,394	-2,129	25,060	25,102
188	3,76	1,400	-2,264	25,274	25,319
189	3,78	1,381	-2,319	25,173	25,220
190	3,80	1,321	-2,081	25,466	25,505
191	3,82	1,439	-2,672	25,354	25,413
192	3,84	1,341	-2,327	25,023	25,069
193	3,86	1,397	-2,151	25,196	25,239
194	3,88	1,369	-2,571	25,335	25,389
195	3,90	1,322	-2,338	25,399	25,445
196	3,92	1,379	-2,430	25,309	25,359
197	3,94	1,377	-2,174	25,153	25,196
198	3,96	1,460	-2,265	25,080	25,127
199	3,98	1,392	-2,535	25,138	25,192
200	4,00	1,405	-2,463	25,359	25,410

201	4,02	1,444	-2,186	25,273	25,317
202	4,04	1,369	-2,029	25,446	25,484
203	4,06	1,386	-2,296	25,219	25,265
204	4,08	1,391	-2,281	25,242	25,288
205	4,10	1,425	-2,315	25,337	25,385
206	4,12	1,396	-2,636	24,912	24,970
207	4,14	1,497	-2,349	25,314	25,363
208	4,16	1,459	-2,708	25,274	25,335
209	4,18	1,447	-2,251	25,329	25,375
210	4,20	1,478	-2,303	25,092	25,140
211	4,22	1,403	-2,080	25,192	25,232
212	4,24	1,451	-2,215	25,265	25,310
213	4,26	1,396	-2,258	25,328	25,373
214	4,28	1,473	-2,128	25,194	25,237
215	4,30	1,465	-2,177	25,027	25,072
216	4,32	1,485	-2,232	25,156	25,203
217	4,34	1,491	-2,248	25,192	25,239
218	4,36	1,381	-2,277	25,148	25,193
219	4,38	1,551	-2,263	25,236	25,285
220	4,40	1,422	-2,584	24,834	24,891
221	4,42	1,424	-1,985	25,113	25,152
222	4,44	1,513	-2,093	25,097	25,141
223	4,46	1,377	-1,859	25,014	25,049
224	4,48	1,561	-2,303	25,406	25,456
225	4,50	1,460	-1,870	25,214	25,251
226	4,52	1,441	-2,198	25,171	25,216
227	4,54	1,535	-2,314	25,163	25,213
228	4,56	1,478	-2,190	25,120	25,165
229	4,58	1,490	-2,056	25,139	25,180
230	4,60	1,486	-2,137	25,207	25,251
231	4,62	1,504	-2,345	25,060	25,111
232	4,64	1,425	-2,249	25,208	25,253
233	4,66	1,551	-2,224	25,131	25,178
234	4,68	1,467	-2,001	25,243	25,283
235	4,70	1,507	-2,358	25,088	25,139
236	4,72	1,513	-2,175	25,081	25,126
237	4,74	1,409	-2,294	24,985	25,032
238	4,76	1,504	-1,927	25,414	25,452
239	4,78	1,412	-2,541	24,896	24,952
240	4,80	1,502	-2,131	25,209	25,253
241	4,82	1,448	-2,351	25,154	25,203
242	4,84	1,495	-2,410	24,824	24,876
243	4,86	1,509	-2,293	25,430	25,478
244	4,88	1,435	-2,374	24,905	24,956
245	4,90	1,497	-1,818	25,061	25,097
246	4,92	1,397	-2,529	24,846	24,900
247	4,94	1,471	-2,484	24,722	24,777
248	4,96	1,458	-2,030	25,367	25,407
249	4,98	1,486	-2,534	25,315	25,371
250	5,00	1,484	-2,048	25,337	25,378



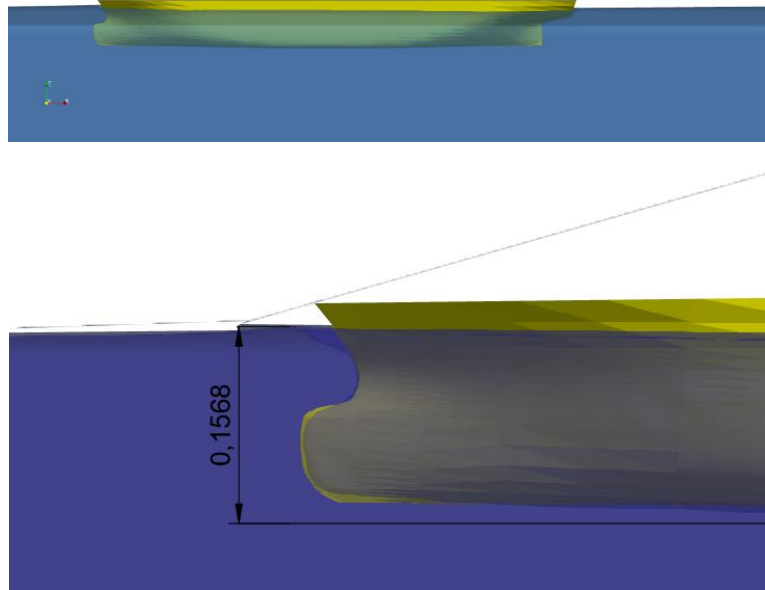
Berdasarkan grafik diatas, nilai tahanan model kapal tanpa bulbous bow terjadi pada waktu 2,5 – 3,0 s. Sehingga apabila dirata – ratakan nilai tahanan model kapal 2,715 N.

LAMPIRAN 7

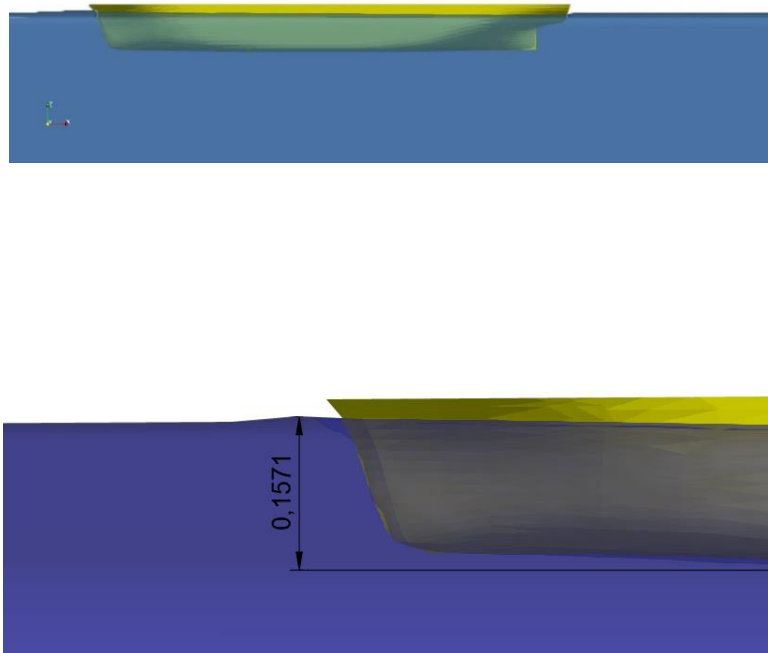
Lampiran 7.

Visualisasi aliran fluida di setiap variasi kecepatan

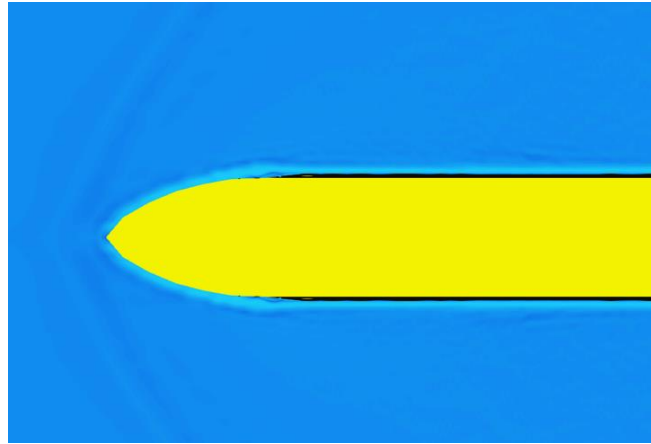
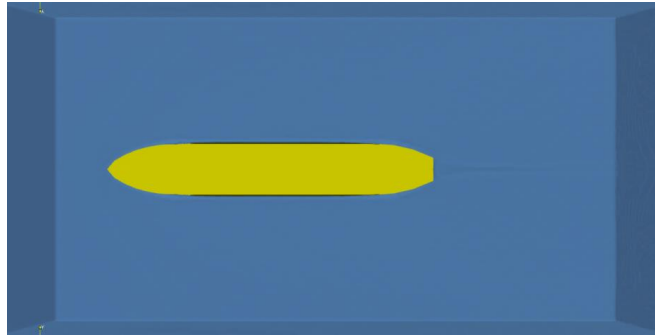
- Kecepatan 0,406 m/s



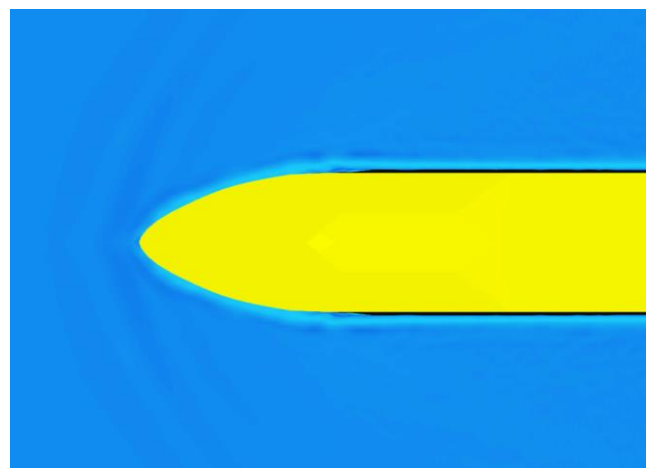
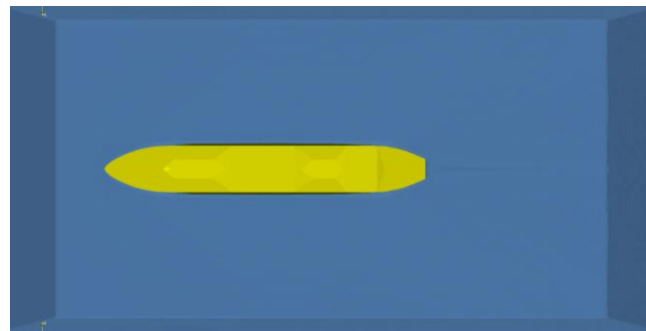
(a) Model kapal yang menggunakan *bulbous bow* (Sumbu Y)



(b) Model kapal tanpa *bulbous bow* (Sumbu Y)

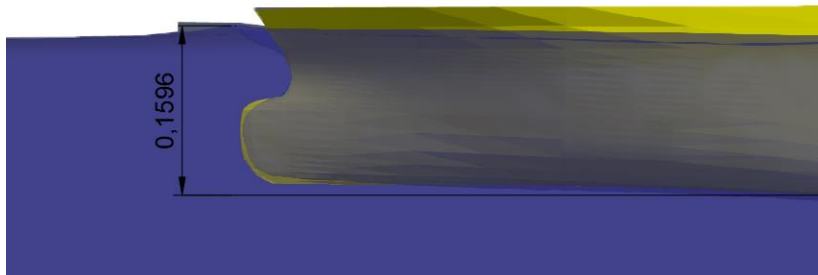


(c) Model kapal yang menggunakan *bulbous bow* (Sumbu z)

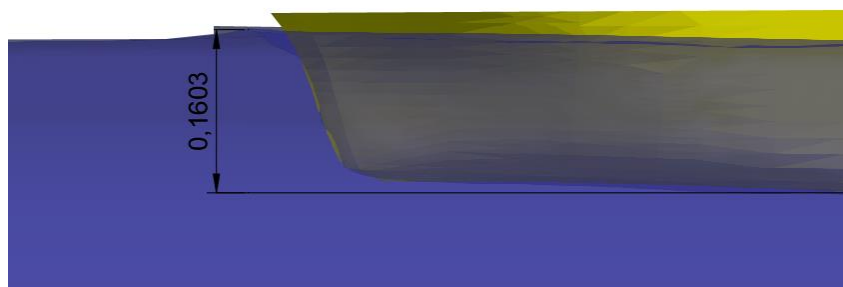


(d) Model kapal tanpa *bulbous bow* (Sumbu z)

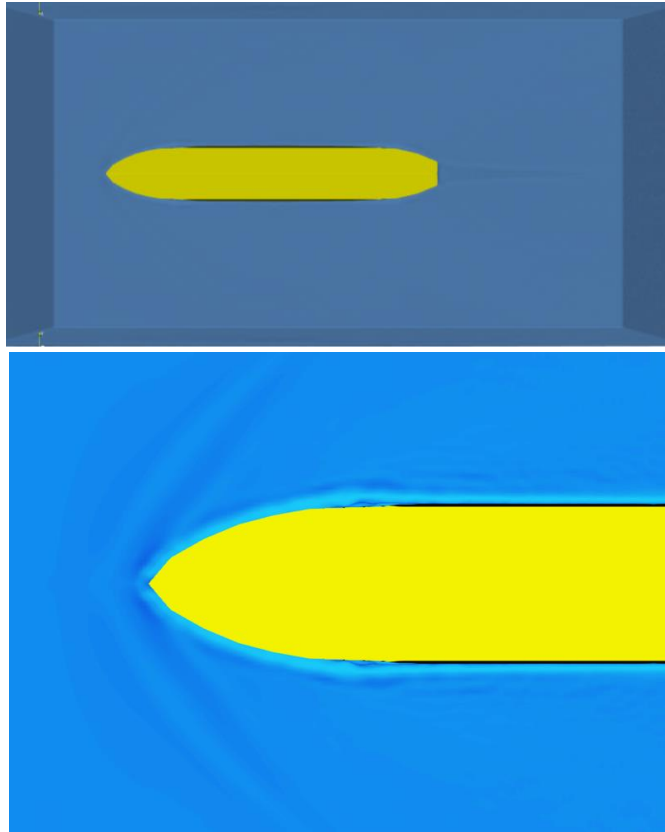
- Kecepatan 0,488 m/s



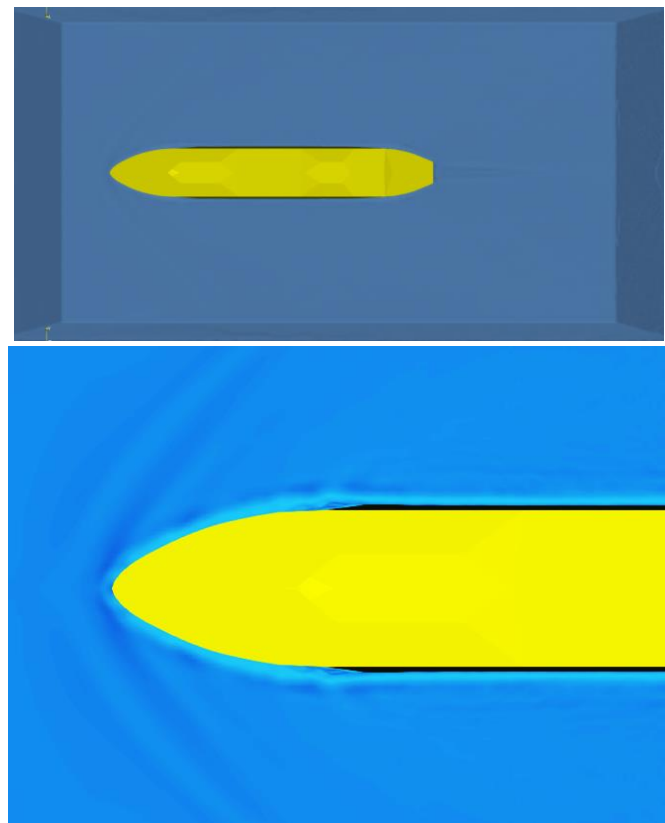
(a) Model kapal yang menggunakan *bulbous bow* (Sumbu Y)



(b) Model kapal tanpa *bulbous bow* (Sumbu Y)



(c) Model kapal yang menggunakan *bulbous bow* (Sumbu z)

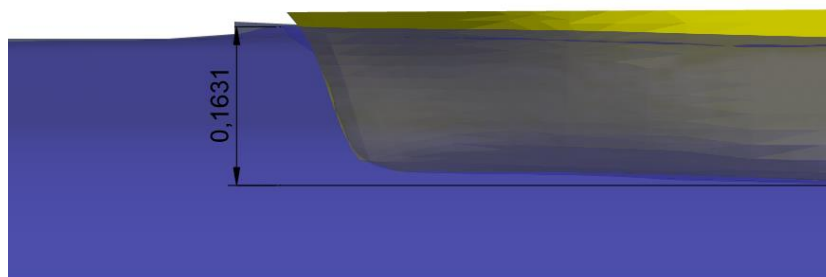


(d) Model kapal tanpa *bulbous bow* (Sumbu z)

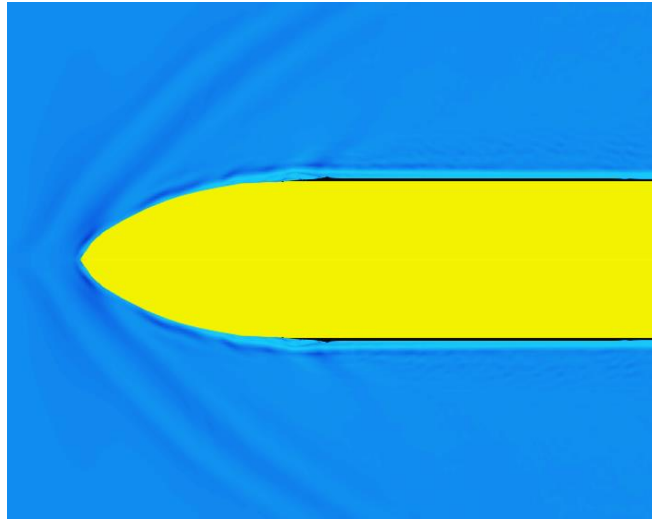
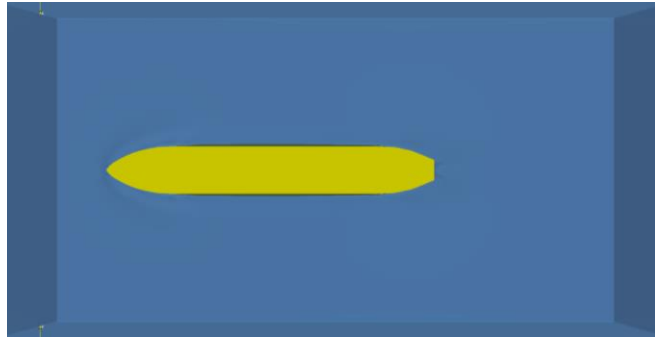
- Kecepatan 0,569 m/s



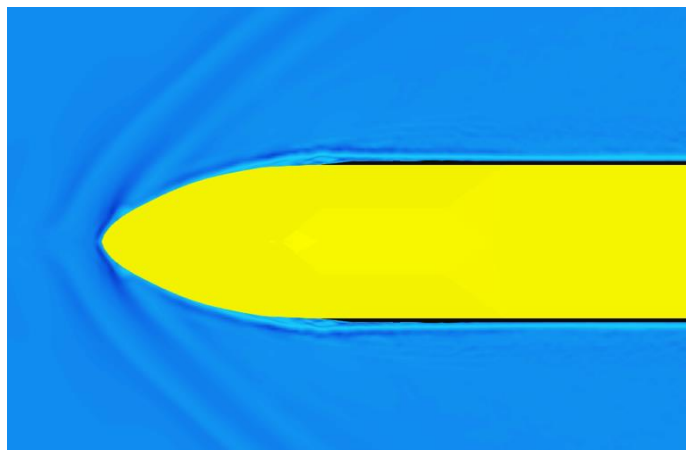
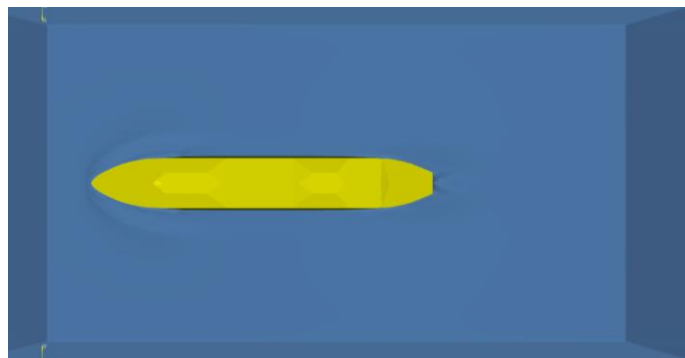
(a) Model kapal yang menggunakan *bulbous bow* (Sumbu Y)



(b) Model kapal tanpa *bulbous bow* (Sumbu Y)

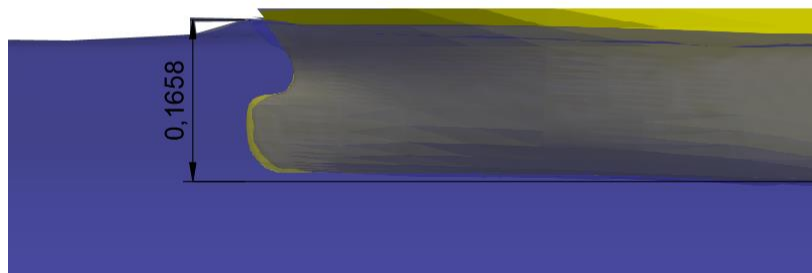
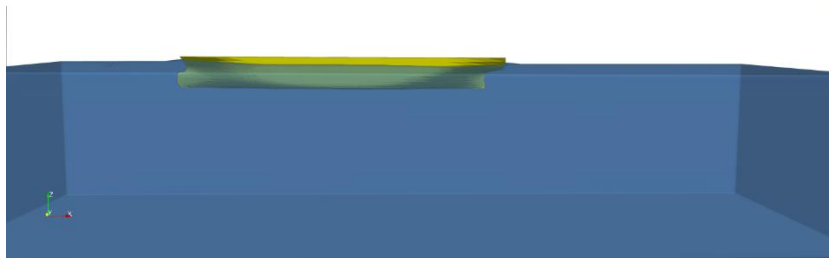


(c) Model kapal yang menggunakan *bulbous bow* (Sumbu z)

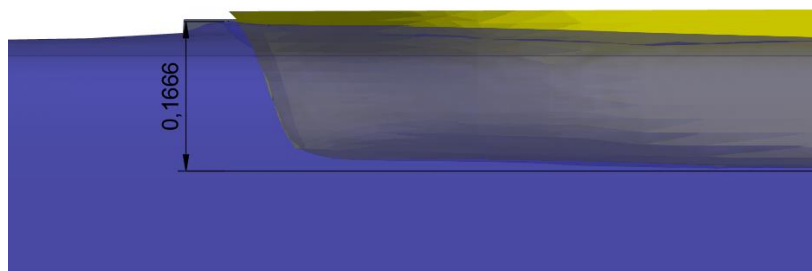


(d) Model kapal tanpa *bulbous bow* (Sumbu z)

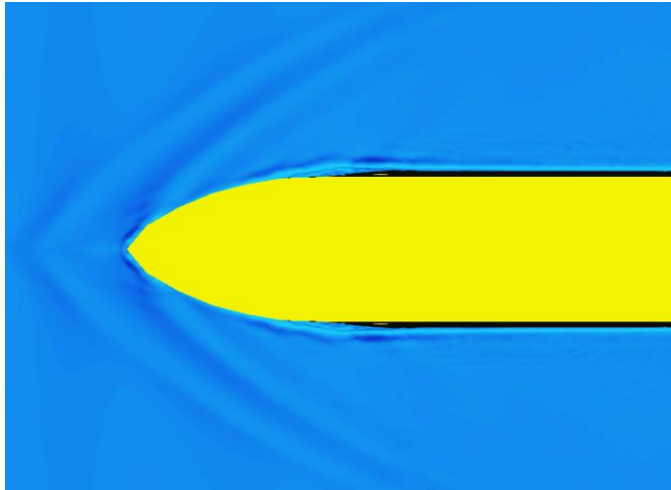
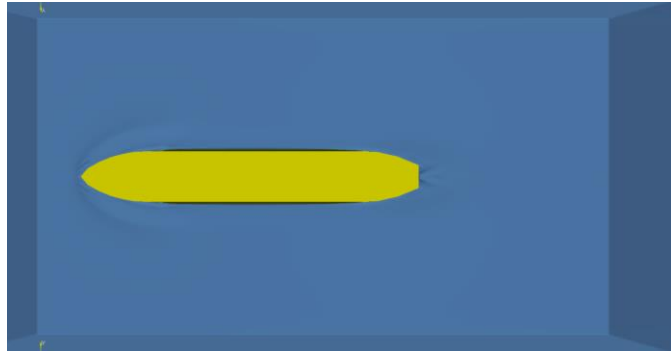
- Kecepatan 0,650 m/s



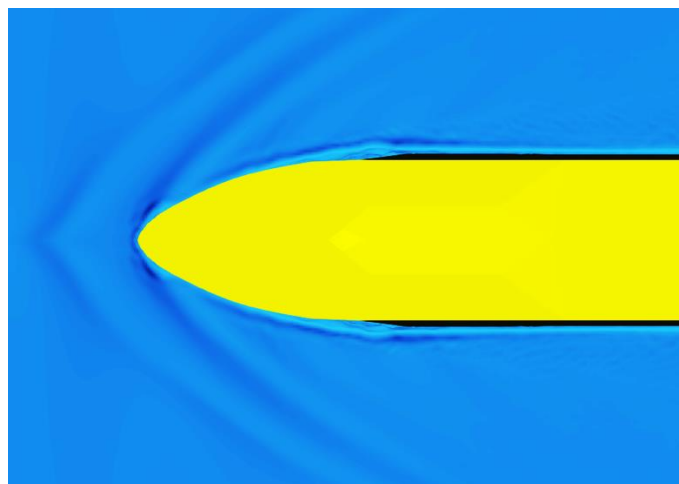
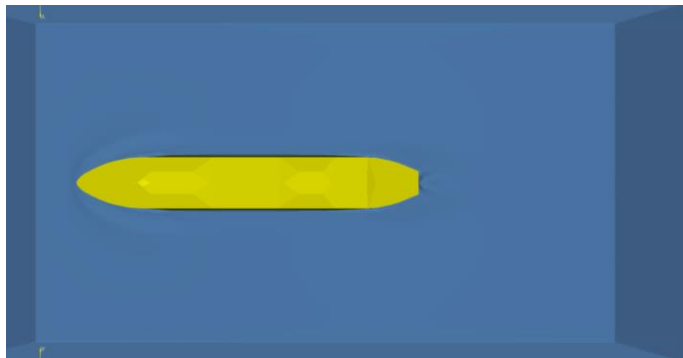
(a) Model kapal yang menggunakan *bulbous bow* (Sumbu Y)



(b) Model kapal tanpa *bulbous bow* (Sumbu Y)

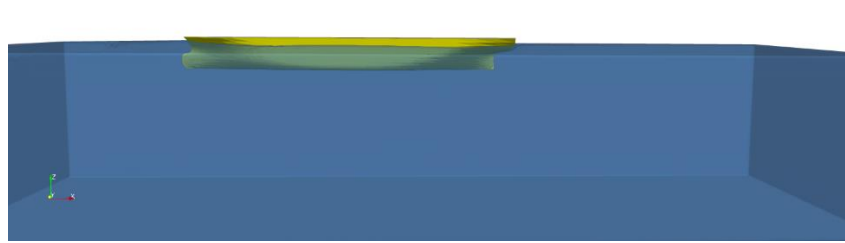


(c) Model kapal yang menggunakan *bulbous bow* (Sumbu z)

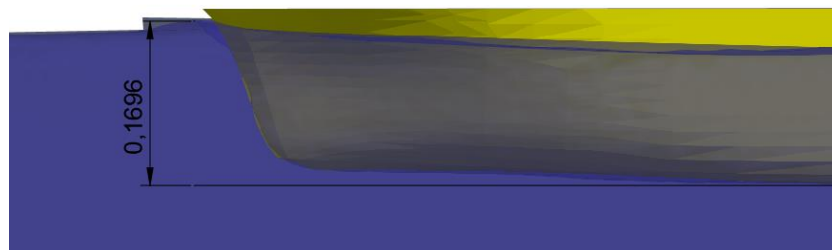
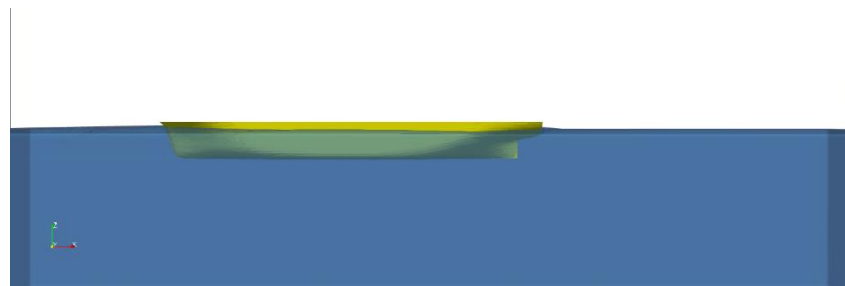


(d) Model kapal tanpa *bulbous bow* (Sumbu z)

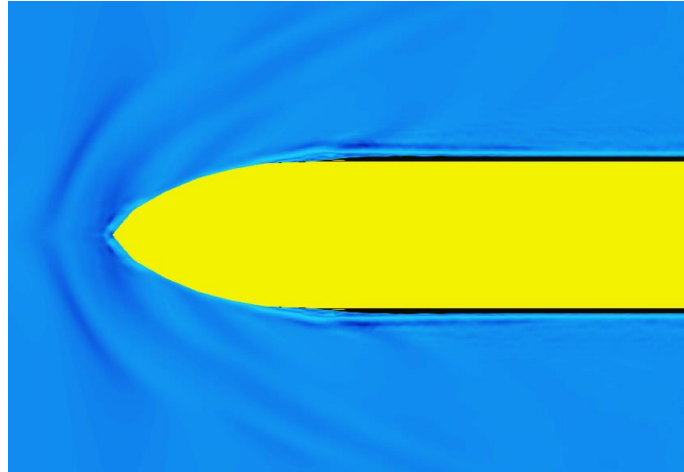
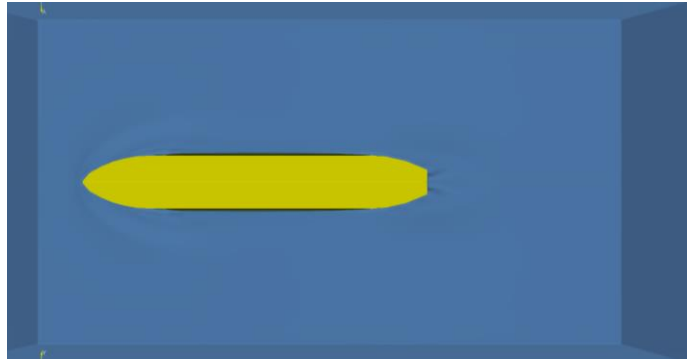
- Kecepatan 0,732 m/s



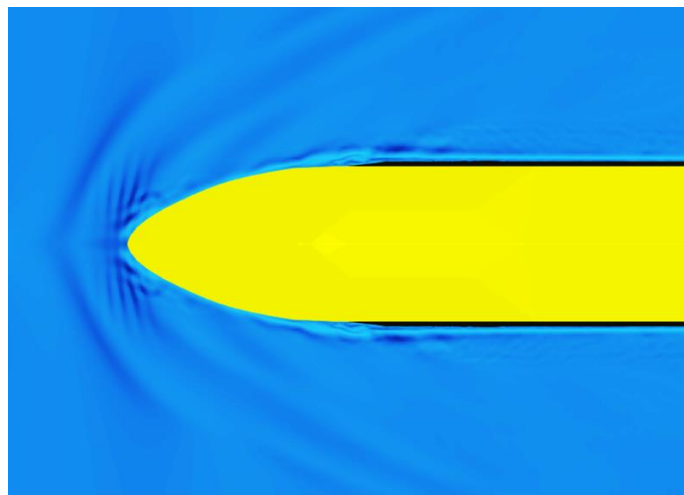
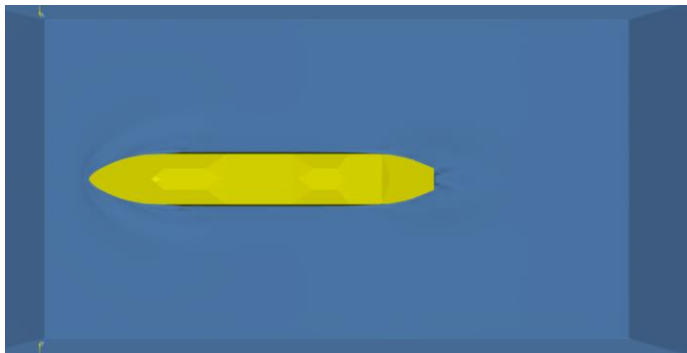
(a) Model kapal yang menggunakan *bulbous bow* (Sumbu Y)



(b) Model kapal tanpa *bulbous bow* (Sumbu Y)

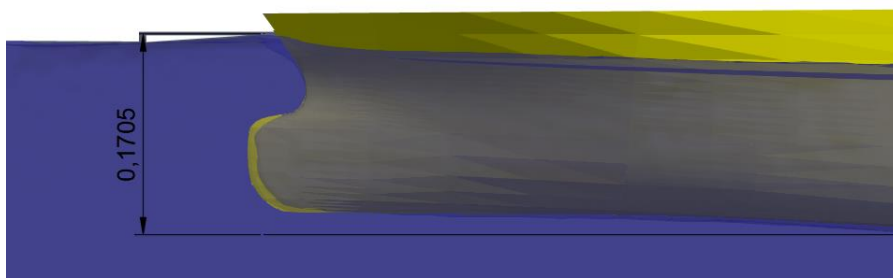
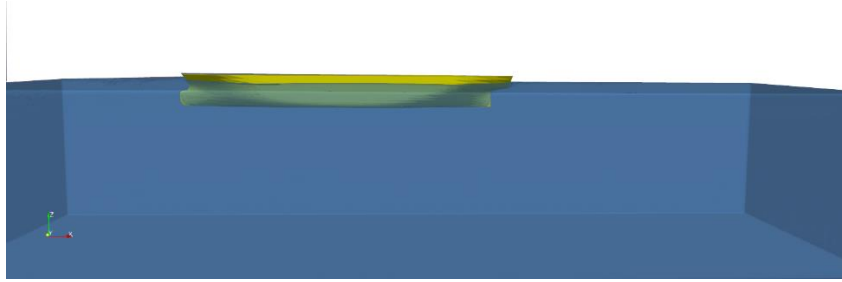


(c) Model kapal yang menggunakan *bulbous bow* (Sumbu z)

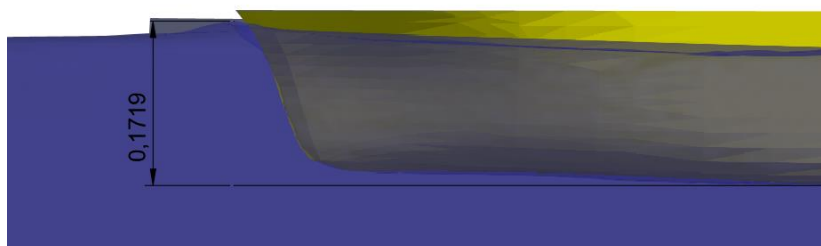


(d) Model kapal tanpa *bulbous bow* (Sumbu z)

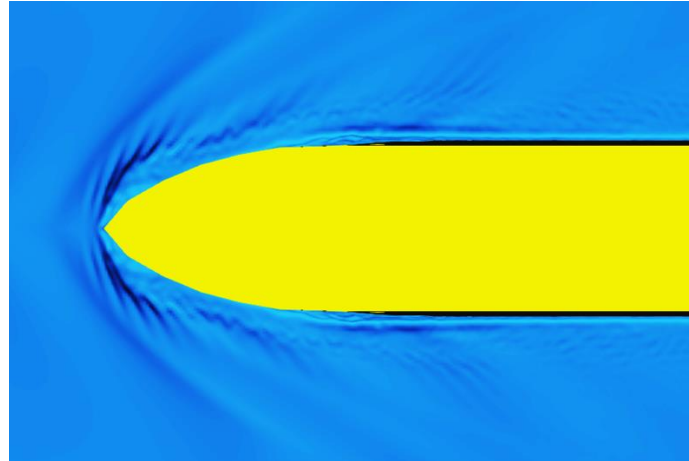
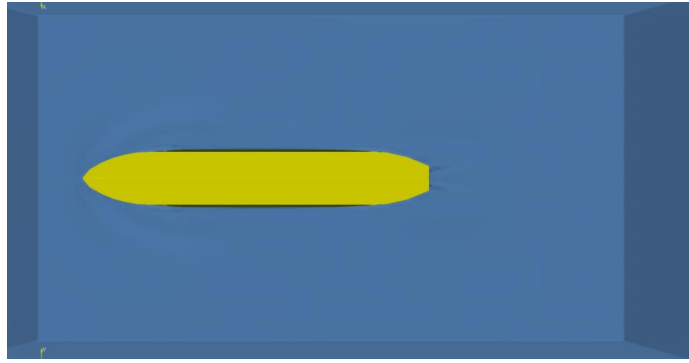
- Kecepatan 0,813 m/s



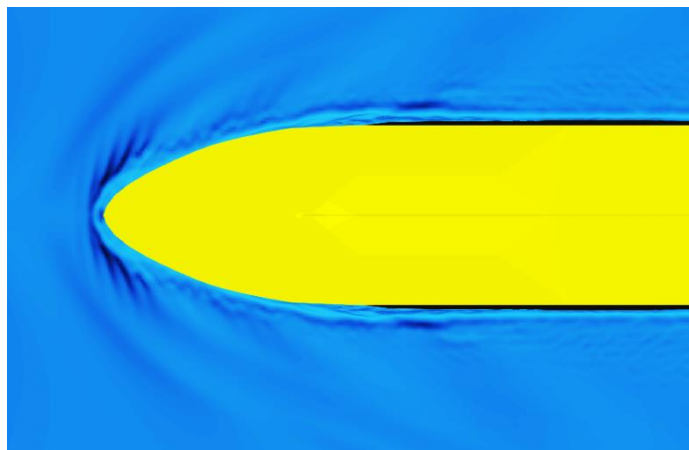
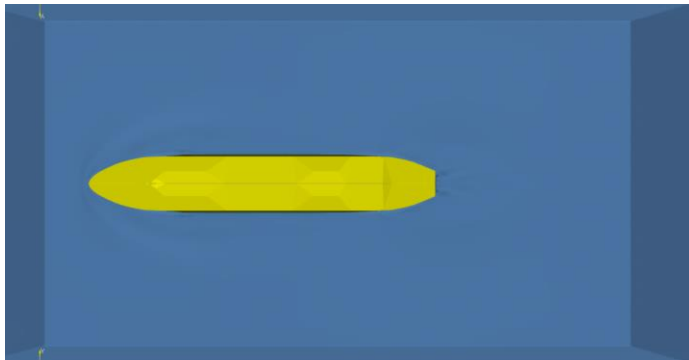
(a) Model kapal yang menggunakan *bulbous bow* (Sumbu Y)



(b) Model kapal tanpa *bulbous bow* (Sumbu Y)

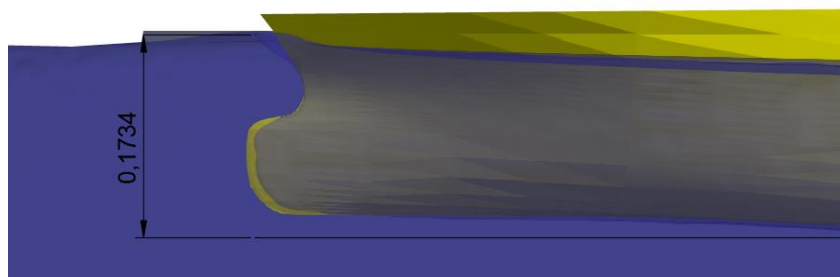


(c) Model kapal yang menggunakan *bulbous bow* (Sumbu z)

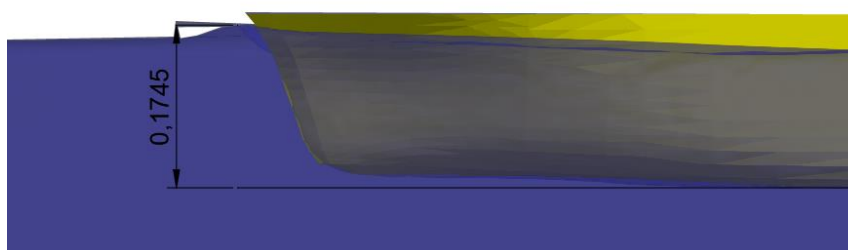
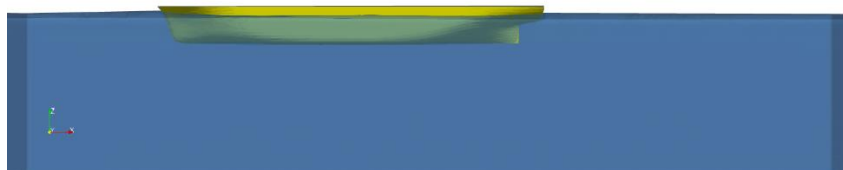


(d) Model kapal tanpa *bulbous bow* (Sumbu z)

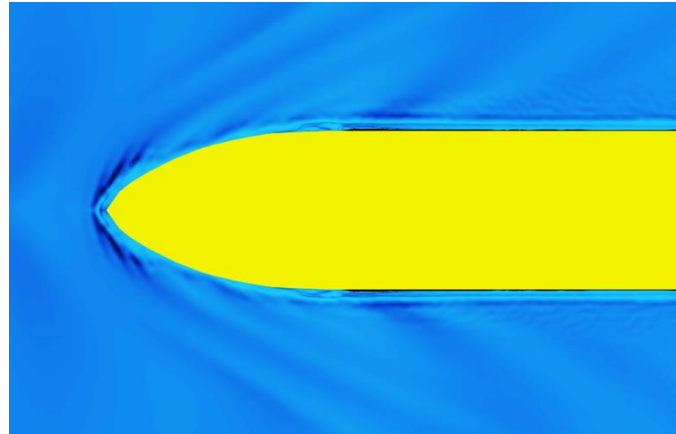
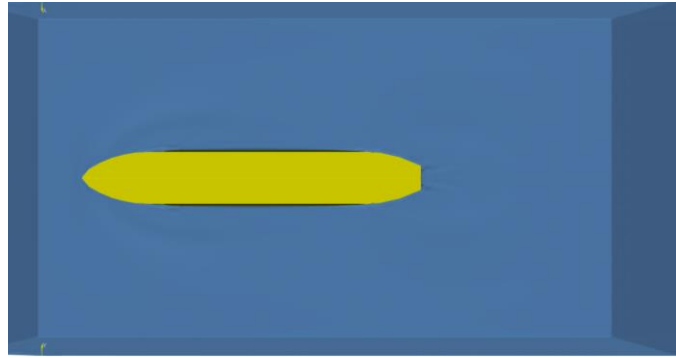
- Kecepatan 0,894 m/s



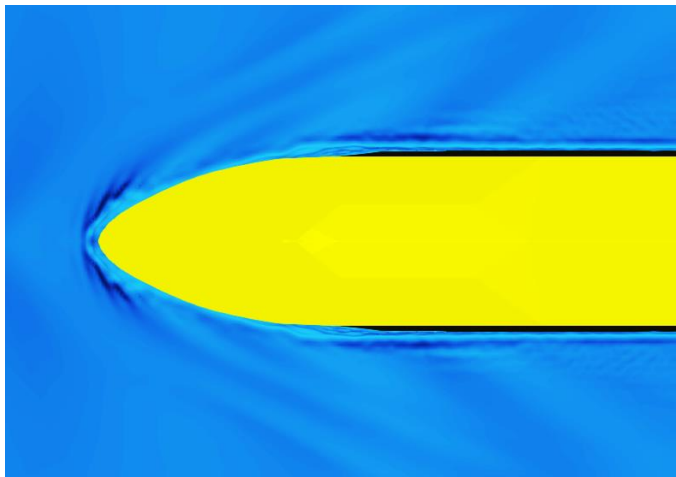
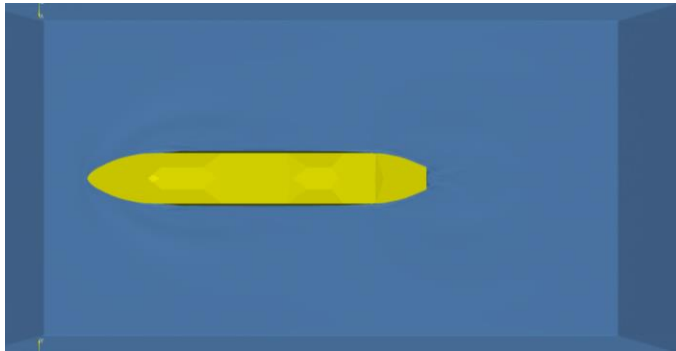
(a) Model kapal yang menggunakan *bulbous bow* (Sumbu Y)



(b) Model kapal tanpa *bulbous bow* (Sumbu Y)



(c) Model kapal yang menggunakan *bulbous bow* (Sumbu z)



(d) Model kapal tanpa *bulbous bow* (Sumbu z)

LAMPIRAN 8

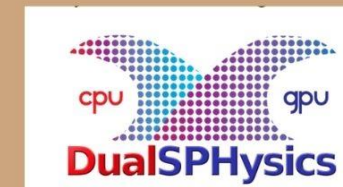


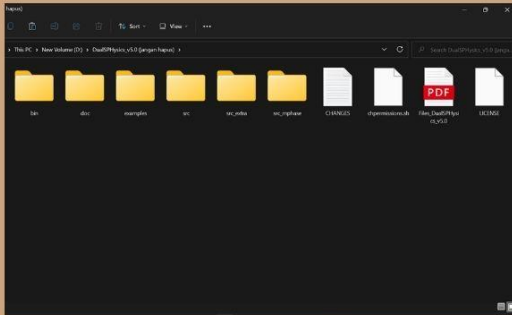
Pengenalan software
DualSPHysics

DualSPHysics adalah perangkat dengan model SPH yang efisien dan user-friendly dengan kode numerikal untuk pengaplikasian yang luas pada bidang hydraulic, perkapalan, dan rekayasa kelautau.

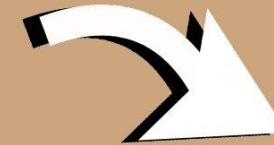
SPH atau Smoothed Particle Hydrodynamics mendiskritkan fluida atau struktur kontinu menjadi titik - titik, titik - titik ini dimulai sebagai partikel material yang masing - masing memiliki satu set kuantitas fisik pada pada waktu tertentu. Untuk dinamika fluida, sifat - sifat ini seperti posisi, kecepatan, percepatan, kepadatan (density) dan juga tekanan. Sifat - sifat partikel tunggal dihitung dengan mengintegrasikan persamaan Navier-Stokes yang didiskritkan pada posisi partikel pada partikel tetangga

Fitur utama SPH adalah mensimulasikan gerakan dan properti partikel individu dari waktu ke waktu dan karenanya menghilangkan kebutuhan untuk struktur mesh yang kompleks yang umumnya digunakan untuk simulasi fluida. Ini membuat SPH sangat berguna untuk permukaan bebas yang kompleks dan bergerak, geometri fluida yang kompleks, interaksi fluida-struktur dan juga untuk interaksi antara beberapa fluida dengan properti yang berbeda

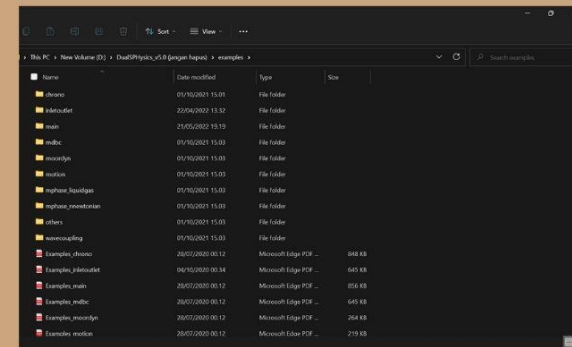
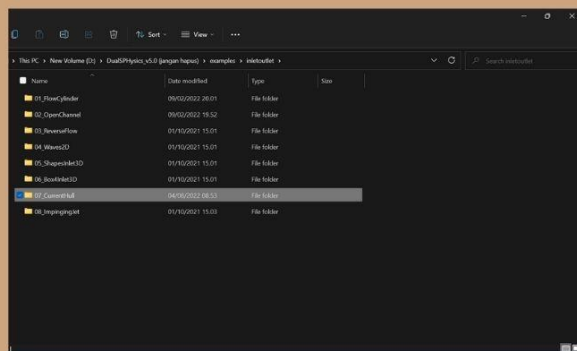


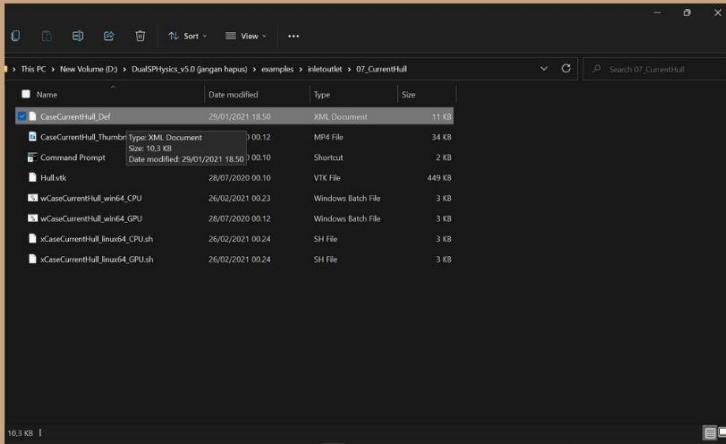


pada software DualSPHysics terdapat beberapa folder yang masing - masing memiliki kegunaannya sendiri, seperti folder example berisikan contoh setting untuk memulai simulasi dengan berbagai macam kondisi



untuk simulasi tahanan sendiri kita akan memakai setting yang ada pada folder current hull

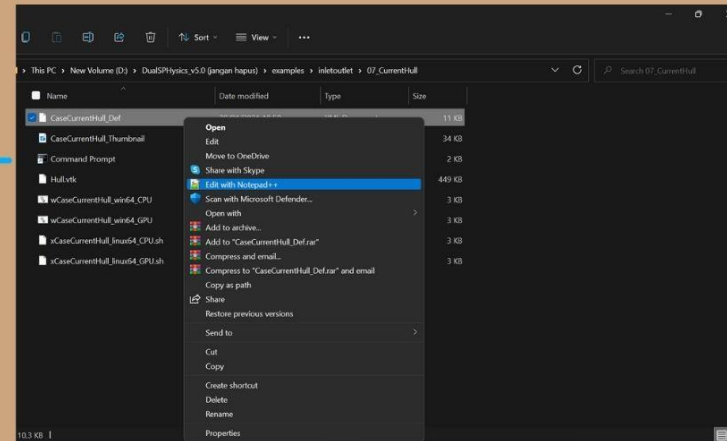




Di dalam folder dualSPHysics ada beberapa file, salah satunya adalah file definition, yang berfungsi sebagai setting untuk proses simulasi yang akan dilakukan. meliputi bentuk kolom, domain, jarak partikel, kecepatan, dsb

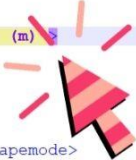


untuk memulai setting perintah,
maka perlu bantuan software
Notepad++



```
D:\DualSPHysics_v5.0 (jangan hapus)\examples\inletoutlet\07_CurrentHull\CaseCurrentHull_Def.xml - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
CaseCurrentHull_Def.xml CaseCurrentHull_Def.xml CaseCurrentHull_Def.xml wCaseCurrentHull_win64_GPU.bat wCaseCurrentHull_win64_GPU.bat
1 <<?xml version="1.0" encoding="UTF-8" ?>
2 <case app="GenCase4 v4.0.077 (14-08-2018)" date="13-09-2018 18:54:50">
3   <casedef>
4     <constantsdef>
5       <gravity x="0" y="0" z="-9.81" comment="Gravitational acceleration" units_comment="m/s^2" />
6       <rho0 value="1000" comment="Reference density of the fluid" units_comment="kg/m^3" />
7       <hswl value="0" auto="true" comment="Maximum still water level to calculate speedofsound using coefsound" units_comment="metres (m)" />
8       <gamma value="7" comment="Polytropic constant for water used in the state equation" />
9       <speedsystem value="3" auto="false" comment="Maximum system speed (by default the dam-break propagation is used)" />
10      <coefsound value="20" comment="Coefficient to multiply speedsystem" />
11      <speedsound value="0" auto="true" comment="Speed of sound to use in the simulation (by default speedofsound=coefsound*speedsystem)" />
12      <hdp value="2" comment="Alternative option to calculate the smoothing length (h=hdp*dp)" />
13      <cflnumber value="0.2" comment="Coefficient to multiply dt" />
14    </constantsdef>
15    <mkconfig boundcount="240" fluidcount="9" />
16    <geometry>
17      <definition dp="0.01" units_comment="metres (m)" />
18      <pointmin x="-0.3" y="-1" z="-1" />
19      <pointmax x="2.1" y="1" z="1" />
20    </definition>
21    <commands>
22      <mainlist>
23        <setshapemode>actual | bound</setshapemode>
24        <setdrawmode mode="full" />
25        <setmkfluid mk="1" />
26        <drawbox>
27          <boxfill>left</boxfill>
28          <point x="-0.2" y="-0.5" z="0" />
29          <size x="2.2" y="1" z="0.4" />
30        </drawbox>
31        <setmkfluid mk="2" />
32        <drawbox>
33          <boxfill>right</boxfill>
34          <point x="-0.2" y="-0.5" z="0" />
35          <size x="2.2" y="1" z="0.4" />

```



perintah awal yaitu geometry definition, berisi pengaturan dp (distance between particles) dan domain sebagai koordinat untuk proses simulasi

eXtensible Markup Language file length : 10.597 lines : 139 Ln : 17 Col : 22 Pos : 1.283 Windows (CR LF) UTF-8 INS

2.4.1. XML file: Casedef-Geometry-Definition

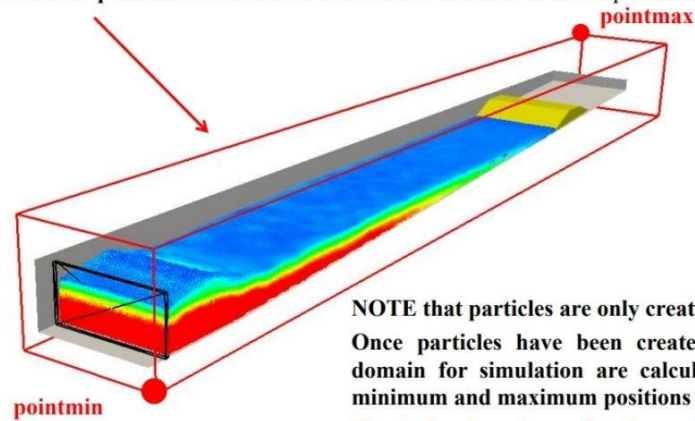
19

```
<!--DEFINITION OF DOMAIN WHERE PARTICLES WILL BE CREATED -->  
<definition dp="0.005">  
  <pointmin x="-0.05" y="0.1" z="-0.05" />  
  <pointmax x=" 2.00" y="0.1" z=" 1.00" />  
</definition>
```

dp defines the distance between particles

WHEN CHANGING THIS PARAMETER, THE TOTAL NUMBER OF PARTICLES IS MODIFIED

pointmin & pointmax defines the dimensions of the domain where particles can be created




NOTE that particles are only created within this domain.
Once particles have been created the dimensions of the domain for simulation are calculated again starting from minimum and maximum positions of the created particles.
Simulation domain can be also configured in `<parameters>`

semakin kecil dp maka jarak antar partikel juga akan semakin rapati



domain terdiri dari 3 koordinat dan masing - masing memiliki pointmin dan pointmax

```
D:\DualSPPhysics_v5.0 (jangan hapus)\examples\inletoutlet\07_CurrentHull\CaseCurrentHull_Def.xml - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
CaseCurrentHull_Def.xml CaseCurrentHull_Def.xml CaseCurrentHull_Def.xml wCaseCurrentHull_win64_GPU.bat wCaseCurrentHull_win64_GPU.bat
22 <mainlist>
23   <setshapemode>actual | bound</setshapemode>
24   <setdrawmode mode="full" />
25   <setmkfluid mk="1" />
26   <drawbox>
27     <boxfill>left</boxfill>
28     <point x="-0.2" y="-0.5" z="0" />
29     <size x="2.2" y="1" z="0.4" />
30   </drawbox>
31   <setmkfluid mk="2" />
32   <drawbox>
33     <boxfill>right</boxfill>
34     <point x="-0.2" y="-0.5" z="0" />
35     <size x="2.2" y="1" z="0.4" />
36   </drawbox>
37   <setmkbound mk="0" />
38   <drawbox>
39     <boxfill>bottom | front | back</boxfill>
40     <point x="-2" y="-0.5" z="0" />
41     <size x="5" y="1" z="0.4" />
42   </drawbox>
43   <setmkbound mk="20" />
44   <drawfilevtk file="Hull.vtk">
45     <drawmove x="0.75" y="0" z="0.13" />
46   </drawfilevtk>
47   <setmkfluid mk="0" />
48   <setboxlimitmode mode="full" />
49   <fillbox x="0.1" y="0" z="0.1">
50     <modefill>void</modefill>
51     <point x="-2" y="-1" z="-1" />
52     <size x="5" y="2" z="1.2" />
53   </fillbox>
54   <shapeout file="" />
55 </mainlist>
56 </commands>
```



kemudian untuk pembuatan kolom simulasi sendiri kita masukkan dimensinya pada perintah drawbox, dimana terdiri dari bagian left, right, bottom front back

perintah point untuk koordinat awal dari kolom sedangkan size adalah ukuran kolom terhitung dari koordinat yang dibuat

```
D:\DualSPHysics_v5.0 (jangan hapus)\examples\inletoutlet\07_CurrentHull\CaseCurrentHull_Def.xml - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
CaseCurrentHull_Def.xml CaseCurrentHull_Def.xml CaseCurrentHull_Def.xml wCaseCurrentHull_win64_GPU.bat wCaseCurrentHull_win64_GPU.bat
28 <point x="-0.2" y="-0.5" z="0" />
29 <size x="2.2" y="1" z="0.4" />
30 </drawbox>
31 <setmkfluid mk="2" />
32 <drawbox>
33 <boxfill>right</boxfill>
34 <point x="-0.2" y="-0.5" z="0" />
35 <size x="2.2" y="1" z="0.4" />
36 </drawbox>
37 <setmkbound mk="0" />
38 <drawbox>
39 <boxfill>bottom | front | back</boxfill>
40 <point x="-2" y="-0.5" z="0" />
41 <size x="5" y="1" z="0.4" />
42 </drawbox>
43 <setmkbound mk="20" />
44 <drawfilevtk file="Hull.vtk" />
45 <drawmove x="0.75" y="0" z="0.13" />
46 </drawfilevtk>
47 <setmkfluid mk="0" />
48 <setboxlimitmode mode="full" />
49 <fillbox x="0.1" y="0" z="0.1">
50 <modefill>void</modefill>
51 <point x="-2" y="-1" z="-1" />
52 <size x="5" y="2" z="1.2" />
53 </fillbox>
54 <shapeout file="" />
55 </mainlist>
56 </commands>
57 </geometry>
58 <!-- <floatings> -->
59 <!-- <floating mkbound="20" rhopbody="1000"> -->
60 <!-- <center x="1.1" y="0" z="0.24" /> -->
61 <!-- </floating> -->
62 <!-- </floatings> -->
eXtensible Markup Language file length : 10.597 lines : 139 Ln : 44 Col : 27 Pos : 2.515 Windows (CR LF) UTF-8 INS
```

untuk model yang akan disimulasikan dimasukkan pada perintah drawfilevtk, dimana agar model bisa disimulasikan jenis filenya harus vtk atau stl

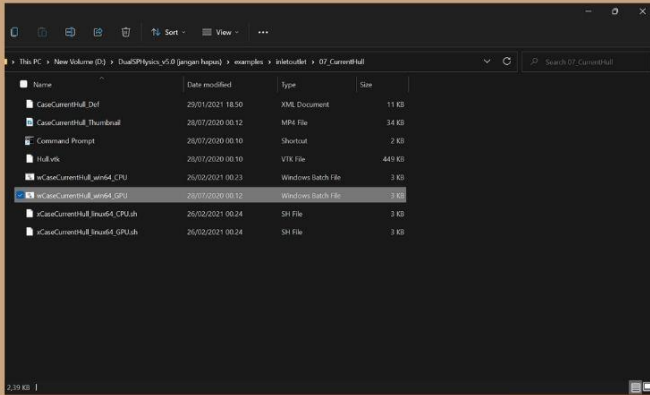
posisi model sendiri diatur pada perintah drawmove. x adalah jarak model terhadap bagian depan kolam, y adalah jarak model terhadap bagian samping kolam dan z merupakan ketinggian model dari dasar kolam

```
D:\DualSPHysics_v5.0 (jangan hapus)\examples\inletoutlet\07_CurrentHull\CaseCurrentHull_Def.xml - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
CaseCurrentHull_Def.xml CaseCurrentHull_Def.xml CaseCurrentHull_Def.xml wCaseCurrentHull_win64_GPU.bat wCaseCurrentHull_win64_GPU.bat
61 <!-- </floating> -->
62 <!-- </floatings> -->
63 <initials>
64 <velocity mkfluid="0" x="1.5" y="0" z="0" />
65 </initials>
66 </casedef>
67 <execution>
68 <special>
69 <inout>
70 <memoryresize size0="2" size="4" comment="Initial memory resize (size0) and the following memory resizes according to initial inlet/outlet" />
71 <determlimit value="1e+3" comment="Use 1e-3 for first_order or 1e+3 for zeroth_order (default=1e+3)" />
72 <inoutzone>
73 <refilling value="1" comment="Refilling mode. 0:Simple full, 1:Simple below zsurf, 2:Advanced for reverse flows (very slow) (default=0)" />
74 <inputtreatment value="2" comment="Treatment of fluid entering the zone. 0:No changes, 1:Convert fluid (necessary for outlet), 2:Convert fluid (necessary for inlet)" />
75 <layers value="5" comment="Number of inlet/outlet particle layers" />
76 <zone3d comment="Input zone for 2-D simulations">
77 <particles mkfluid="1" direction="right" />
78 <!-- *** Direction values: left, right, front, back, top, bottom *** -->
79 </zone3d>
80 <imposevelocity mode="0" comment="Imposed velocity 0:fixed value, 1:variable value, 2:Extrapolated velocity, 3:Interpolated velocity" />
81 <velocity v="1.5" comment="Uniform velocity" units_comment="m/s" />
82 </imposevelocity>
83 <imposezsurf mode="2" comment="Outlet zsurf 0:Imposed fixed value, 1:Hydrostatic, 2:Extrapolated from ghost nodes (default=0)" />
84 <imposezsurf mode="0" comment="Inlet Z-surface 0:Imposed fixed value, 1:Imposed variable value, 2:Calculated from fluid domain (default=0)" />
85 <zsurf value="0.2" comment="Characteristic inlet Z-surface (used for Hydrostatic option)" units_comment="m" />
86 </imposezsurf>
87 </inoutzone>
88 <inoutzone>
89 <refilling value="1" comment="Refilling mode. 0:Simple full, 1:Simple below zsurf, 2:Advanced for reverse flows (very slow) (default=0)" />
90 <inputtreatment value="1" comment="Treatment of fluid entering the zone. 0:No changes, 1:Convert fluid (necessary for outlet), 2:Convert fluid (necessary for inlet)" />
91 <layers value="8" comment="Number of inlet/outlet particle layers" />
92 <zone3d comment="Input zone for 2-D simulations">
93 <particles mkfluid="2" direction="left" />
94 </zone3d>
95 <imposevelocity mode="0" comment="Imposed velocity 0:fixed value, 1:variable value, 2:Extrapolated velocity, 3:Interpolated velocity" />
eXtensible Markup Language file length: 10.597 lines: 139 Ln: 64 Col: 18 Pos: 3.351 Windows (CR LF) UTF-8 INS
```

setelah itu untuk kecepatan model dimasukkan pada perintah initials - velocity

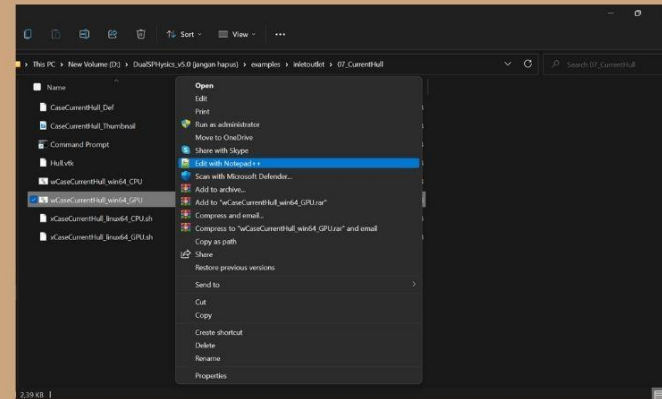
```
D:\DualSPHysics_v5.0 (jangan hapus)\examples\inletoutlet\07_CurrentHull\CaseCurrentHull_Def.xml - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
CaseCurrentHull_Def.xml CaseCurrentHull_Def.xml CaseCurrentHull_Def.xml wCaseCurrentHull_win64_GPU.bat wCaseCurrentHull_win64_GPU.bat
103 </inout>
104 </special>
105 <parameters>
106 <parameter key="SavePosDouble" value="0" comment="Saves particle position using double precision (default=0)" />
107 <parameter key="StepAlgorithm" value="2" comment="Step Algorithm 1:Verlet, 2:Symplectic (default=1)" />
108 <parameter key="VerletSteps" value="40" comment="Verlet only: Number of steps to apply Euler timestepping (default=40)" />
109 <parameter key="Kernel" value="1" comment="Interaction Kernel 1:Cubic Spline, 2:Wendland (default=2)" />
110 <parameter key="ViscoTreatment" value="1" comment="Viscosity formulation 1:Artificial, 2:Laminar+SPS (default=1)" />
111 <parameter key="Visco" value="0.02" comment="Viscosity value" />
112 <parameter key="ViscoBoundFactor" value="0" comment="Multiply viscosity value with boundary (default=1)" />
113 <parameter key="DensityDT" value="2" comment="Density Diffusion Term 0:None, 1:Molteni, 2:Fourtakas, 3:Fourtakas(full) (default=0)" />
114 <parameter key="DensityDTvalue" value="0.1" comment="DDT value (default=0.1)" />
115 <parameter key="Shifting" value="0" comment="Shifting mode 0:None, 1:Ignore bound, 2:Ignore fixed, 3:Full (default=0)" />
116 <parameter key="ShiftCoef" value="-2" comment="Coefficient for shifting computation (default=-2)" />
117 <parameter key="ShiftTFS" value="0" comment="Threshold to detect free surface. Typically 1.5 for 2D and 2.75 for 3D (default=0)" />
118 <parameter key="RigidAlgorithm" value="1" comment="Rigid Algorithm 0:collision-free, 1:SPH, 2:DEM, 3:Chrono (default=1)" />
119 <parameter key="FtPause" value="0.0" comment="Time to freeze the floatings at simulation start (warmup) (default=0)" units_comment="seconds" />
120 <parameter key="CoefDtMin" value="0.05" comment="Coefficient to calculate minimum time step dtmin=coefdtmin*h/speedsound (default=0.05)" />
121 <parameter key="DtIni" value="0" comment="Initial time step. Use 0 to default use (default=h/speedsound)" units_comment="seconds" />
122 <parameter key="DtMin" value="0" comment="Minimum time step. Use 0 to default use (default=coefdtmin*h/speedsound)" units_comment="seconds" />
123 <parameter key="DtFixed" value="0" comment="Fixed Dt value. Use 0 to disable (default=disabled)" units_comment="seconds" />
124 <parameter key="DtFixedFile" value="NONE" comment="Dt values are loaded from file. Use NONE to disable (default=disabled)" units_comment="seconds" />
125 <parameter key="DtAllParticles" value="0" comment="Velocity of particles used to calculate DT. 1:All, 0:Only fluid/floating (default=0)" />
126 <parameter key="TimeMax" value="2" comment="Time of simulation" units_comment="seconds" />
127 <parameter key="TimeOut" value="0.01" comment="Time out data" units_comment="seconds" />
128 <parameter key="PartsOutMax" value="1" comment="%/100 of fluid particles allowed to be excluded from domain (default=1)" units_comment="de" />
129 <parameter key="RhopOutMin" value="700" comment="Minimum rhop valid (default=700)" units_comment="kg/m^3" />
130 <parameter key="RhopOutMax" value="1300" comment="Maximum rhop valid (default=1300)" units_comment="kg/m^3" />
131 <parameter key="#XPeriodicIncZ" value="0" comment="Increase of Z with periodic BC in axis X" units_comment="metres (m)" />
132 <simulationdomain comment="Defines domain of simulation (default=Uses minimum and maximum position of the generated particles)">
133 <posmin x="default" y="default" z="default" comment="e.g.: x=0.5, y=default-1, z=default-1" />
134 <posmax x="default" y="default" z="1.0" />
135 </simulationdomain>
136 </parameters>
137 </execution>
```

perintah timemax untuk mengatur lama aliran fluida saat simulasi



tahap selanjutnya adalah execution, yaitu tahap untuk membuat perintah hal - hal apa saja yang diperlukan sebagai output dari proses simulasi ini

sama dengan tahap definisi tadi, untuk membuat perintah maka perlu bantuan software Notepad++



```

37 }
38 }
39
40 :run
41 ren "dirout" to store results is removed if it already exists
42 if exist %dirout% rd /s /q %dirout%
43
44 ren CODES are executed according the selected parameters of execution in this testcase
45
46 %gencase% %name%_Def %dirout%\%name% -save:all
47 if not "%ERRORLEVEL%" == "0" goto fail
48
49 %dualphysicsgpu% -gpu %dirout%\%name% %dirout% -dirdataout data -cvres
50 if not "%ERRORLEVEL%" == "0" goto fail
51
52 :postprocessing
53 set dirout2=%dirout%\particles
54 %partvtk% -dirin %diroutdata% -savevtk %dirout2%\PartFluid -onlytype=all,fluid
55 if not "%ERRORLEVEL%" == "0" goto fail
56
57 %partvtkout% -dirin %diroutdata% -savevtk %dirout2%\PartFluidOut -SaveResume %dirout2%\_ResumeFluidOut
58 if not "%ERRORLEVEL%" == "0" goto fail
59
60 set dirout2=%dirout%\boundary
61 %boudaryvtk% -loadvtk AutoActual -motiondata %diroutdata% -savevtkdata %dirout2%\Box.vtk -onlymk10 -savevtkdata %dirout2%\Hull.vtk -onlymk:30
62 if not "%ERRORLEVEL%" == "0" goto fail
63
64 set dirout2=%dirout%\surface
65 %surosurface% -dirin %diroutdata% -saveiro %dirout2%\Surface
66 if not "%ERRORLEVEL%" == "0" goto fail
67
68
69
70 :success
71 echo All done

```

jika perintah pada execution telah dilakukan maka selanjutnya adalah proses run-up

ini adalah contoh perintah untuk output dari proses simulasi DualSPHysics. semakin banyak data yang diperlukan sebagai hasil simulasi maka perintah pada postprocessing juga akan ditambahkan semakin banyak

```

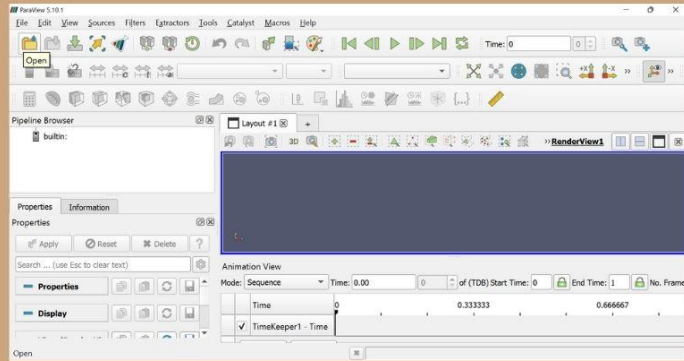
C:\WINDOWS\system32\cmd.exe
InOut point definition:
Initial particles inFluid=2 (x,y,z): (2,-0.49,0.81)-(2,0.49,0.4)
InOut Position: (1.995,0,0.205)
InOut Direction: (-1,0,0)
InOut points: 3960
Initial InOut particles: 15840
Layers: 8
Refilling mode: Simple-Zsurf
Input treatment: Convert fluid
Density mode: Extrapolated
Velocity mode: Fixed
Velocity profile: Uniform -1.5
Z-Surface mode: Fixed (uniform)
Z-Surface value (initial): 0.2
Z-Bottom value: 0.01

**CellDiv: Requested gpu memory for 669991 particles: 5.2 MB.
**CellDiv: Requested gpu memory for 19116 cells (CellMode=Full): 0.3 MB.
Allocated memory in CPU: 55789460 (53.13 MB)
Allocated memory in GPU: 110871884 (105.74 MB)
Part_0000 597474 particles successfully stored
Particles new: 25740 (total new: 25740) - Current np: 507474

[WARNINGS]
1. The kernel Cubic Spline is not available in GaugeSystem, so kernel Wendland is used.

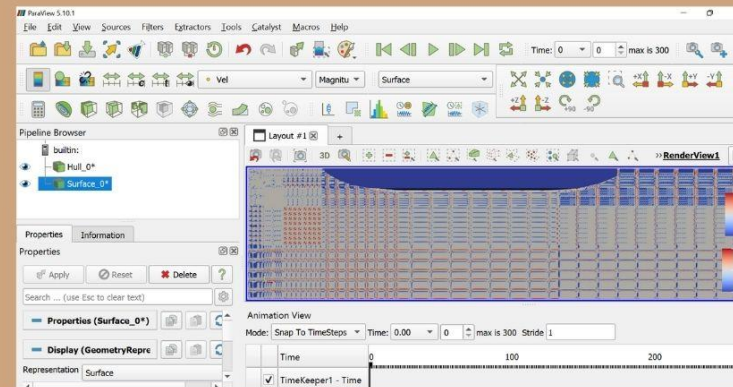
[Initialising simulation (Sub1270) 04-08-2022 08:53:07]
PART PartTime TotalSteps Steps Time/Sec Finish time
*****

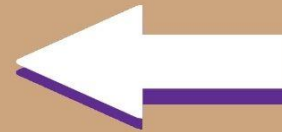
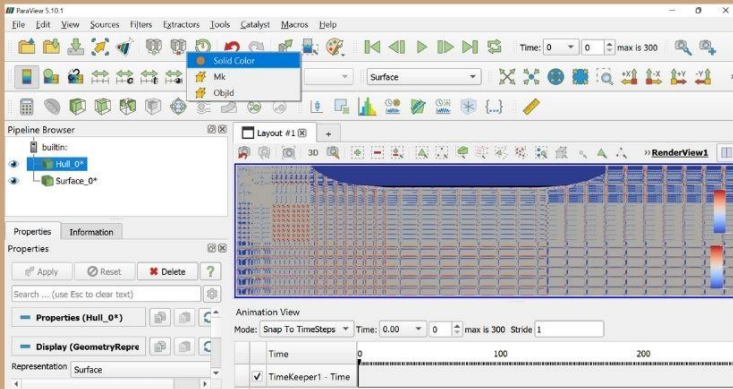
```



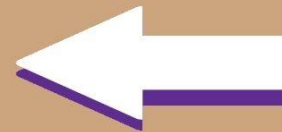
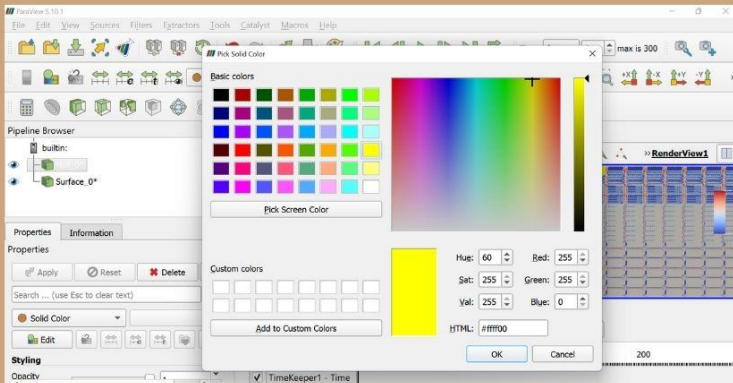
berikut tampilan awal ketika kita membuka file yang akan divisualisasikan

untuk visualisasi hasil simulasi digunakan software ParaView 5.10.0-RC1. untuk membuka file klik icon open

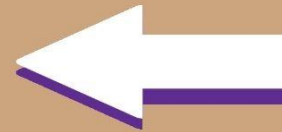
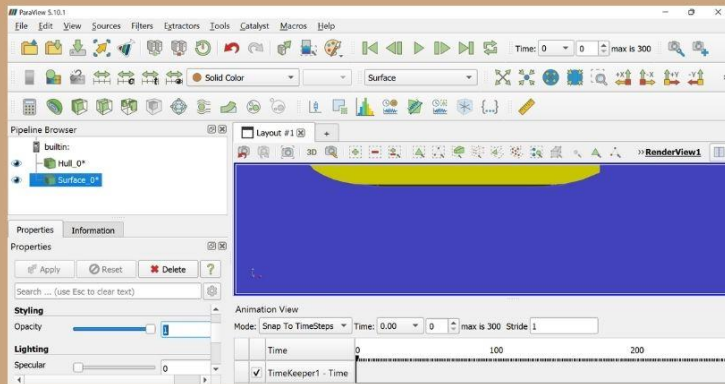




ada beberapa pilihan untuk visualisasi bentuk, silahkan pilih sesuai yang diinginkan

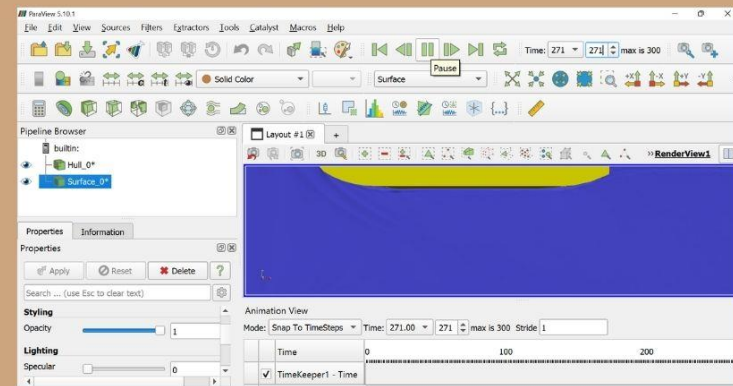


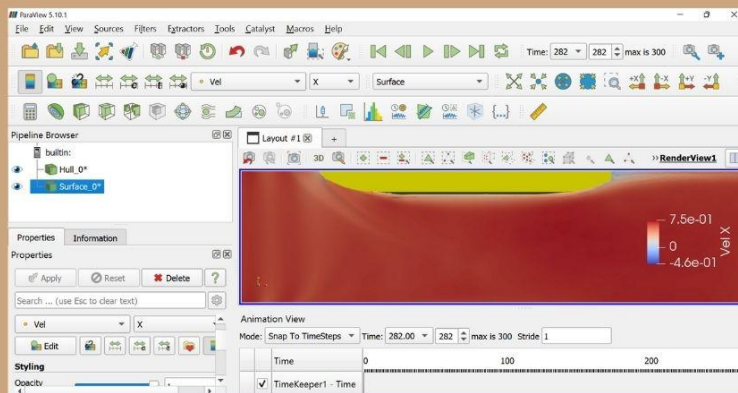
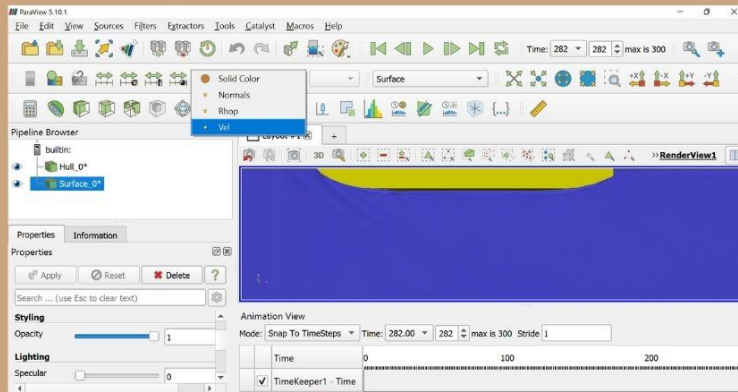
untuk mengubah warna dapat dilakukan dengan klik icon edit



untuk membuat fluida menjadi transparan bisa dengan mengubah opacity

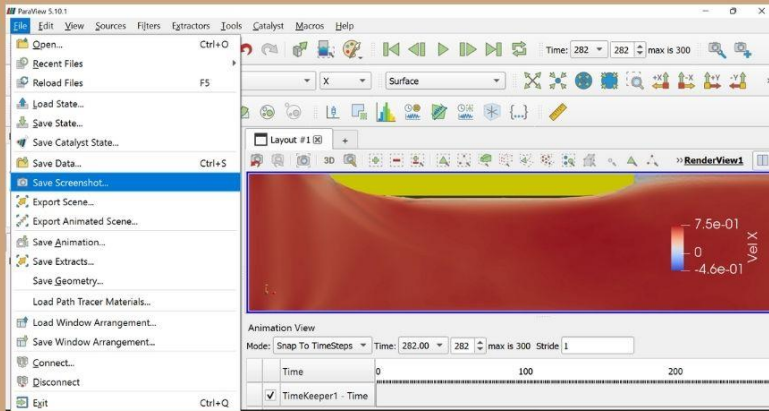
untuk melihat bagaimana pergerakan aliran bisa dengan klik icon play pada bagian atas menu tab





untuk visualisasi velocity magnitude bisa dengan mengubah surface menjadi tampilan vel. maka tampilannya akan menjadi seperti ini





menyimpan screenshot silahkan klik icon file - save screenshot

lalu pilih resolusi dari hasil screenshot, setelah itu klik ok dan gambar akan tersimpan

