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LAMPIRAN

Lampiran 1. Hasil analisis tahanan kapal

Nilai tahanan kapal bentuk awalNilai tahanan kapal kondisi 1

Speed (Knot)	Froude No. LWL	Froude No. Volume	Holtrop Resistance (kN)	Holtrop Power (Kw)
10	0,333	0,77	16	82,156
10,1	0,337	0,778	16,4	85,246
10,2	0,34	0,786	16,8	88,315
10,3	0,343	0,793	17,2	91,378
10,4	0,347	0,801	17,7	94,454
10,5	0,35	0,809	18,1	97,566
10,6	0,353	0,816	18,5	100,742
10,7	0,357	0,824	18,9	104,007
10,8	0,36	0,832	19,3	107,392
10,9	0,363	0,84	19,8	110,927
11	0,367	0,847	20,3	114,641
11,1	0,37	0,855	20,8	118,566
11,2	0,373	0,863	21,3	122,734
11,3	0,377	0,87	21,9	127,176
11,4	0,38	0,878	22,5	131,926
11,5	0,383	0,886	23,2	137,018
11,6	0,387	0,894	23,9	142,488
11,7	0,39	0,901	24,7	148,374
11,8	0,393	0,909	25,5	154,713
11,9	0,397	0,917	26,4	161,546
12	0,4	0,924	27,4	168,923
12,1	0,403	0,932	28,5	177,41
12,2	0,407	0,94	29,6	186,025
12,3	0,41	0,947	30,8	194,767
12,4	0,413	0,955	31,9	203,638
12,5	0,417	0,963	33,1	212,637
12,6	0,42	0,971	34,2	221,764
12,7	0,423	0,978	35,4	231,021
12,8	0,427	0,986	36,5	240,407
12,9	0,43	0,994	37,7	249,922
13	0,433	1,001	38,8	259,567
13,1	0,437	1,009	40	269,342
13,2	0,44	1,017	41,1	279,247
13,3	0,443	1,024	42,3	289,283
	447	1,032	43,4	299,449
	45	1,04	44,6	309,746
	453	1,048	45,8	320,175
	457	1,055	46,9	330,735
	46	1,063	48,1	341,426
	463	1,071	49,3	352,25
	467	1,078	50,4	363,206

Nilai tahanan kapal kondisi 2

Speed (Knot)	Froude No. LWL	Froude No. Volume	Holltrop Resistance (kN)	Holtrop Power (Kw)
10	0,333	0,773	15,600	80,032
10,1	0,337	0,781	16	83,008
10,2	0,34	0,789	16,4	85,971
10,3	0,343	0,796	16,8	88,935
10,4	0,347	0,804	17,2	91,92
10,5	0,35	0,812	17,6	94,948
10,6	0,353	0,82	18	98,045
10,7	0,357	0,827	18,4	101,236
10,8	0,36	0,835	18,8	104,55
10,9	0,363	0,843	19,3	108,015
11	0,367	0,851	19,7	111,659
11,1	0,37	0,858	20,2	115,513
11,2	0,373	0,866	20,8	119,606
11,3	0,377	0,874	21,3	123,97
11,4	0,38	0,882	21,9	128,636
11,5	0,383	0,889	22,6	133,637
11,6	0,387	0,897	23,3	139,007
11,7	0,39	0,905	24,1	144,783
11,8	0,393	0,912	24,9	151,001
11,9	0,397	0,92	25,8	157,701
12	0,4	0,928	26,7	164,926
12,1	0,403	0,936	27,8	173,036
12,2	0,407	0,943	28,9	181,268
12,3	0,41	0,951	30	189,622
12,4	0,413	0,959	31,1	198,099
12,5	0,417	0,967	32,1	206,698
12,6	0,42	0,974	33,2	215,42
12,7	0,423	0,982	34,3	224,265
12,8	0,427	0,99	35,4	233,233
12,9	0,43	0,998	36,5	242,325
13	0,433	1,005	37,6	251,541
13,1	0,437	1,013	38,7	260,881
13,2	0,44	1,021	39,8	270,345
13,3	0,443	1,028	40,9	279,934
13,4	0,447	1,036	42	289,647
	0,45	1,044	43,1	299,486
	0,453	1,052	44,2	309,45
	0,457	1,059	45,3	319,54
	0,46	1,067	46,4	329,756
	0,463	1,075	47,6	340,097
	0,467	1,083	48,7	350,565

Nilai tahanan kapal kondisi 3

Speed (Knot)	Froude No. LWL	Froude No. Volume	Holtrop Resistance (kN)	Holtrop Power (Kw)
10	0,334	0,798	12,600	64,872
10,1	0,337	0,806	12,9	67,131
10,2	0,34	0,814	13,2	69,428
10,3	0,344	0,822	13,5	71,775
10,4	0,347	0,83	13,9	74,187
10,5	0,35	0,838	14,2	76,682
10,6	0,354	0,846	14,5	79,275
10,7	0,357	0,854	14,9	81,984
10,8	0,36	0,862	15,3	84,828
10,9	0,364	0,87	15,7	87,825
11	0,367	0,878	16,1	90,994
11,1	0,37	0,886	16,5	94,357
11,2	0,374	0,894	17	97,934
11,3	0,377	0,902	17,5	101,747
11,4	0,38	0,91	18	105,818
11,5	0,384	0,918	18,6	110,173
11,6	0,387	0,926	19,2	114,835
11,7	0,39	0,934	19,9	119,832
11,8	0,394	0,942	20,6	125,19
11,9	0,397	0,95	21,4	130,938
12	0,4	0,958	22,2	137,045
12,1	0,404	0,966	22,9	142,603
12,2	0,407	0,974	23,6	148,244
12,3	0,41	0,982	24,3	153,968
12,4	0,414	0,99	25	159,774
12,5	0,417	0,998	25,8	165,663
12,6	0,42	1,006	26,5	171,636
12,7	0,424	1,014	27,2	177,692
12,8	0,427	1,022	27,9	183,833
12,9	0,43	1,03	28,6	190,057
13	0,434	1,038	29,4	196,365
13,1	0,437	1,046	30,1	202,758
13,2	0,44	1,054	30,8	209,235
13,3	0,444	1,062	31,5	215,798
13,4	0,447	1,07	32,3	222,445
	0,45	1,078	33	229,178
	0,454	1,086	33,7	235,996
	0,457	1,094	34,5	242,9
	0,46	1,102	35,2	249,891
	0,464	1,11	35,9	256,967
	0,467	1,118	36,7	264,13

Nilai tahanan kapal kondisi 4

Speed (Knot)	Fn	FnV	Holtrop Resistance (kN)	Holtrop Power (Kw)
10	0,334	0,804	12,1	62,485
10,1	0,337	0,812	12,4	64,649
10,2	0,34	0,82	12,7	66,857
10,3	0,344	0,828	13	69,122
10,4	0,347	0,836	13,4	71,458
10,5	0,35	0,844	13,7	73,88
10,6	0,354	0,852	14	76,404
10,7	0,357	0,86	14,4	79,046
10,8	0,36	0,868	14,7	81,822
10,9	0,364	0,876	15,1	84,752
11	0,367	0,884	15,5	87,851
11,1	0,37	0,892	16	91,141
11,2	0,374	0,9	16,4	94,64
11,3	0,377	0,908	16,9	98,369
11,4	0,38	0,916	17,5	102,35
11,5	0,384	0,924	18	106,606
11,6	0,387	0,932	18,6	111,16
11,7	0,39	0,94	19,3	116,037
11,8	0,394	0,948	20	121,263
11,9	0,397	0,956	20,7	126,863
12	0,4	0,964	21,5	132,754
12,1	0,404	0,972	22,2	137,913
12,2	0,407	0,98	22,8	143,147
12,3	0,41	0,988	23,5	148,459
12,4	0,414	0,996	24,1	153,846
12,5	0,417	1,004	24,8	159,311
12,6	0,42	1,012	25,4	164,853
12,7	0,424	1,02	26,1	170,472
12,8	0,427	1,029	26,8	176,169
12,9	0,43	1,037	27,4	181,943
13	0,434	1,045	28,1	187,795
13,1	0,437	1,053	28,7	193,726
13,2	0,44	1,061	29,4	199,735
13,3	0,444	1,069	30,1	205,823
	0,447	1,077	30,8	211,989
	0,45	1,085	31,4	218,235
	0,454	1,093	32,1	224,56
	0,457	1,101	32,8	230,964
	0,46	1,109	33,4	237,448
	0,464	1,117	34,1	244,012
	0,467	1,125	34,8	250,657

Lampiran 2. Tabel loadcase dan hasil analisa

Loadcase dan hasil analisa loadcase kondisi 1

Loadcase 1 | Intact

	Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Unit Volume m^3	Total Volume m^3	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m	FSM Type
1	Lightship	1	74,128	74,128			10,000	0,000	0,000	0,000	User Spe
2	BW & GW Tank	0%	2,979	0,000	2,979	0,000	3,490	-1,830	0,753	0,000	Maximum
3	F.W Tank	100%	2,979	2,979	2,979	2,979	2,673	2,286	1,793	0,000	Maximum
4	F.O.T Portside	100%	3,066	3,066	3,247	3,247	12,167	-2,445	2,164	0,000	Maximum
5	F.O.T Starboard	100%	3,066	3,066	3,247	3,247	12,167	2,445	2,164	0,000	Maximum
6	Passenger and Crew	357	0,080	28,560			13,055	0,000	5,473	0,000	User Spe
7	**Total Loadcase**			**111,800**	**12,453**	**9,473**	**10,704**	**0,061**	**1,565**	**0,000**	
8	**FS correction**								**0,000**		
9	**VCG fluid**								**1,565**		

Loadcase 1 | Intact

	Heel to Starboard deg	-40,0	-30,0	-20,0	-10,0	0,0	10,0	20,0
1	GZ m	-2,376	-2,608	-2,296	-1,222	-0,061	1,102	2,181
2	Area under GZ curve from zero he	74,6541	49,5038	24,3270	6,3633	-0,1108	5,1514	21,9391
3	Displacement t	111,8	111,8	111,8	111,8	111,8	111,8	111,8
4	Draft at FP m	0,147	0,901	1,386	1,557	1,611	1,557	1,386
5	Draft at AP m	1,114	1,614	1,882	1,954	1,958	1,954	1,882
6	Trim (+ve by stern) m	0,966	0,713	0,496	0,397	0,348	0,397	0,495
7	WL Length m	24,152	24,135	24,158	24,264	24,280	24,264	24,158
	Beam max extents on WL m	3,644	4,032	7,814	7,911	7,796	7,911	7,814
	Wetted Area m^2	167,043	164,357	188,104	205,117	207,221	205,115	188,095
	Waterpl. Area m^2	45,064	49,434	87,724	100,007	98,784	100,006	87,725
	Prismatic coeff. (Cp)	0,793	0,794	0,753	0,722	0,717	0,722	0,753
	Block coeff. (Cb)	0,803	0,752	0,400	0,424	0,535	0,424	0,400
	LCB from zero pt. (+ve fwd) m	10,653	10,672	10,688	10,696	10,699	10,696	10,689
	LCF from zero pt. (+ve fwd) m	12,371	12,116	11,035	10,594	10,619	10,594	11,035
	Max deck inclination deg	40,0318	30,0322	20,0290	10,0421	0,8210	10,0421	20,0289
	Trim angle (+ve by stern) deg	2,2812	1,6846	1,1712	0,9372	0,8210	0,9371	1,1694

Loadcase dan hasil analisa loadcase kondisi 2

Loadcase 2 | Intact

	Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Unit Volume m^3	Total Volume m^3	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m	FSM Type
1	Lightship	1	74,128	74,128			10,000	0,000	0,000	0,000	User Spe
2	BW & GW Tank	90%	2,979	2,681	2,979	2,681	2,673	-2,284	1,712	0,184	Maximum
3	F.W Tank	10%	2,979	0,298	2,979	0,298	2,837	2,143	1,031	0,184	Maximum
4	F.O.T Portside	10%	3,066	0,307	3,247	0,325	12,094	-2,445	1,628	0,219	Maximum
5	F.O.T Starboard	10%	3,066	0,307	3,247	0,325	12,094	2,445	1,628	0,219	Maximum
6	Passenger and Crew	357	0,080	28,560			13,055	0,000	5,473	0,000	User Spe
7	**Total Loadcase**			**106,281**	**12,453**	**3,629**	**10,628**	**-0,052**	**1,526**	**0,806**	
8	**FS correction**								**0,008**		
9	**VCG fluid**								**1,534**		

Loadcase 2 | Intact

	Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Unit Volume m^3	Total Volume m^3	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m	FSM Type
1	Lightship	1	74,128	74,128			10,000	0,000	0,000	0,000	User Spe
2	BW & GW Tank	90%	2,979	2,681	2,979	2,681	2,673	-2,284	1,712	0,184	Maximum
3	F.W Tank	10%	2,979	0,298	2,979	0,298	2,837	2,143	1,031	0,184	Maximum
4	F.O.T Portside	10%	3,066	0,307	3,247	0,325	12,094	-2,445	1,628	0,219	Maximum
	oard	10%	3,066	0,307	3,247	0,325	12,094	2,445	1,628	0,219	Maximum
	and Crew	357	0,080	28,560			13,055	0,000	5,473	0,000	User Spe
	lcase			**106,281**	**12,453**	**3,629**	**10,628**	**-0,052**	**1,526**	**0,806**	
	ion								**0,008**		
									1,534		

Loadcase dan hasil analisa loadcase kondisi 3

Loadcase 3 | Intact

	Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Unit Volume m^3	Total Volume m^3	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m	FSM Type
1	Lightship	1	74,128	74,128			10,000	0,000	0,000	0,000	User Spe
2	BW & GW Tank	0%	2,979	0,000	2,979	0,000	3,490	-1,830	0,753	0,000	Maximum
3	F.W Tank	100%	2,979	2,979	2,979	2,979	2,673	2,286	1,793	0,000	Maximum
4	F.O.T Portside	100%	3,066	3,066	3,247	3,247	12,167	-2,445	2,164	0,000	Maximum
5	F.O.T Starboard	100%	3,066	3,066	3,247	3,247	12,167	2,445	2,164	0,000	Maximum
6	Passenger and Crew	3	0,080	0,240			13,055	0,000	5,473	0,000	User Spe
7	**Total Loadcase**			**83,480**	**12,453**	**9,473**	**9,906**	**0,082**	**0,239**	**0,000**	
8	**FS correction**								**0,000**		
9	**VCG fluid**								**0,239**		

Loadcase 3 | Intact

	Heel to Starboard deg	-40,0	-30,0	-20,0	-10,0	0,0	10,0	20,0
1	GZ m	-3,177	-3,214	-3,038	-1,729	-0,082	1,568	2,885
2	Area under GZ curve from zero he	97,4907	65,5799	33,6614	9,0875	-0,1483	7,4634	30,4666
3	Displacement t	83,48	83,48	83,48	83,48	83,48	83,48	83,48
4	Draft at FP m	-0,708	0,095	0,712	0,983	1,057	0,984	0,713
5	Draft at AP m	0,613	1,250	1,755	1,869	1,867	1,868	1,755
6	Trim (+ve by stern) m	1,321	1,155	1,043	0,885	0,809	0,885	1,043
7	WL Length m	24,301	24,295	24,291	24,298	24,271	24,298	24,290
8	Beam max extents on WL m	3,967	4,170	7,444	7,891	7,759	7,891	7,444
	d Area m^2	132,953	131,265	145,046	170,935	174,620	170,937	145,046
	pl. Area m^2	59,740	58,306	70,755	91,011	92,077	91,011	70,756
	atic coeff. (Cp)	0,730	0,734	0,718	0,674	0,670	0,674	0,718
	coeff. (Cb)	0,512	0,556	0,391	0,371	0,492	0,371	0,391
	om zero pt. (+ve fwd) m	9,868	9,890	9,914	9,930	9,933	9,930	9,915
	om zero pt. (+ve fwd) m	11,569	11,095	10,335	10,032	10,176	10,033	10,335
	leck inclination deg	40,0593	30,0841	20,1280	10,2074	1,9102	10,2072	20,1278
	ngle (+ve by stern) deg	3,1169	2,7259	2,4621	2,0893	1,9102	2,0885	2,4611

Loadcase dan hasil analisa loadcase kondisi 4

Loadcase 4 | Intact

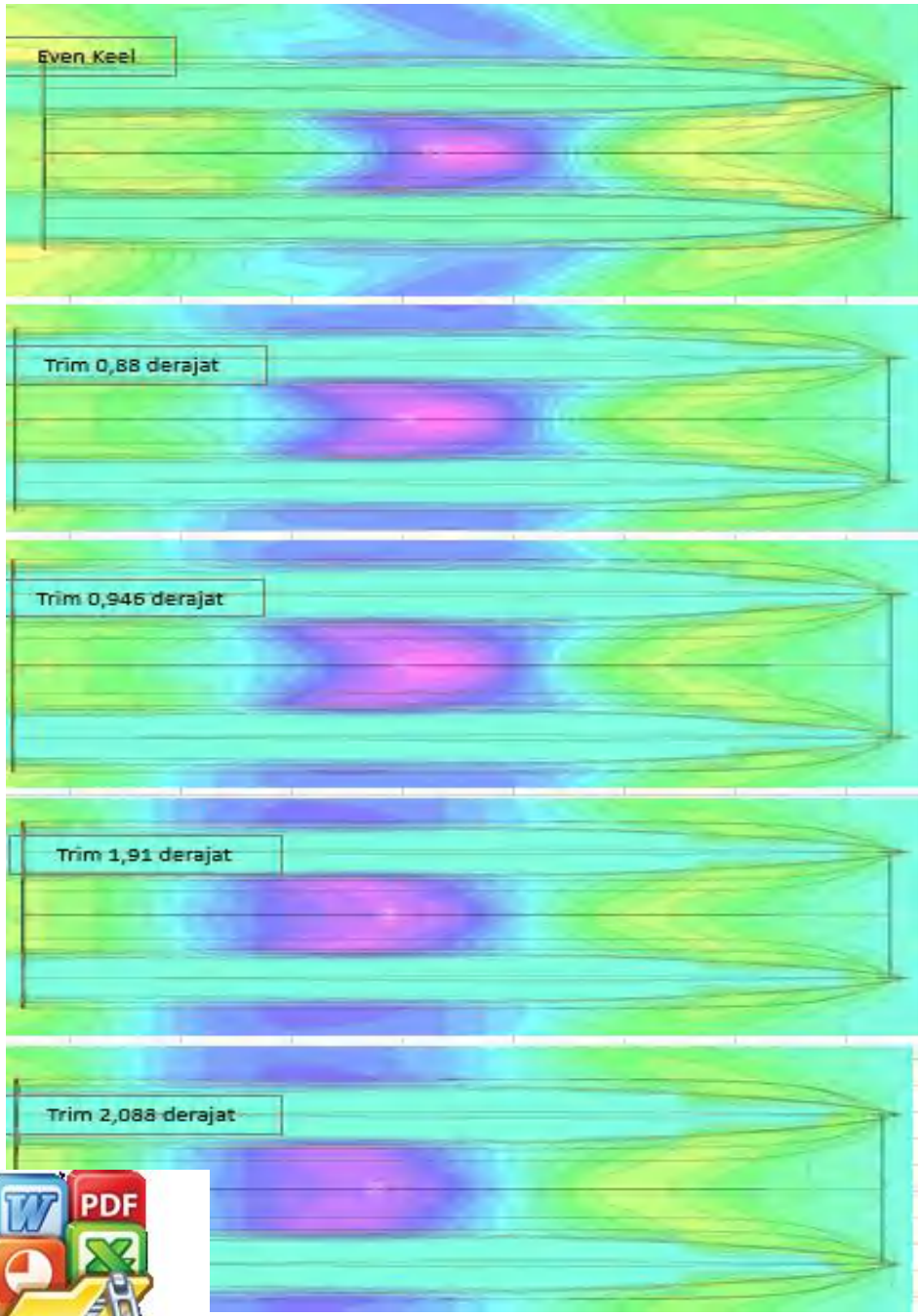
	Item Name	Quantity	Unit Mass tonne	Total Mass tonne	Unit Volume m^3	Total Volume m^3	Long. Arm m	Trans. Arm m	Vert. Arm m	Total FSM tonne.m	FSM Type
1	Lightship	1	74,128	74,128			10,000	0,000	0,000	0,000	User Spe
2	BW & GW Tank	90%	2,979	2,681	2,979	2,681	2,673	-2,284	1,712	0,184	Maximum
3	F.W Tank	10%	2,979	0,298	2,979	0,298	2,837	2,143	1,031	0,184	Maximum
4	F.O.T Portside	10%	3,066	0,307	3,247	0,325	12,094	-2,445	1,628	0,219	Maximum
5	F.O.T Starboard	10%	3,066	0,307	3,247	0,325	12,094	2,445	1,628	0,219	Maximum
6	Passenger and Crew	3	0,080	0,240			13,055	0,000	5,473	0,000	User Spe
7	**Total Loadcase**			**77,961**	**12,453**	**3,629**	**9,746**	**-0,070**	**0,092**	**0,806**	
8	**FS correction**								**0,010**		
9	**VCG fluid**								**0,103**		

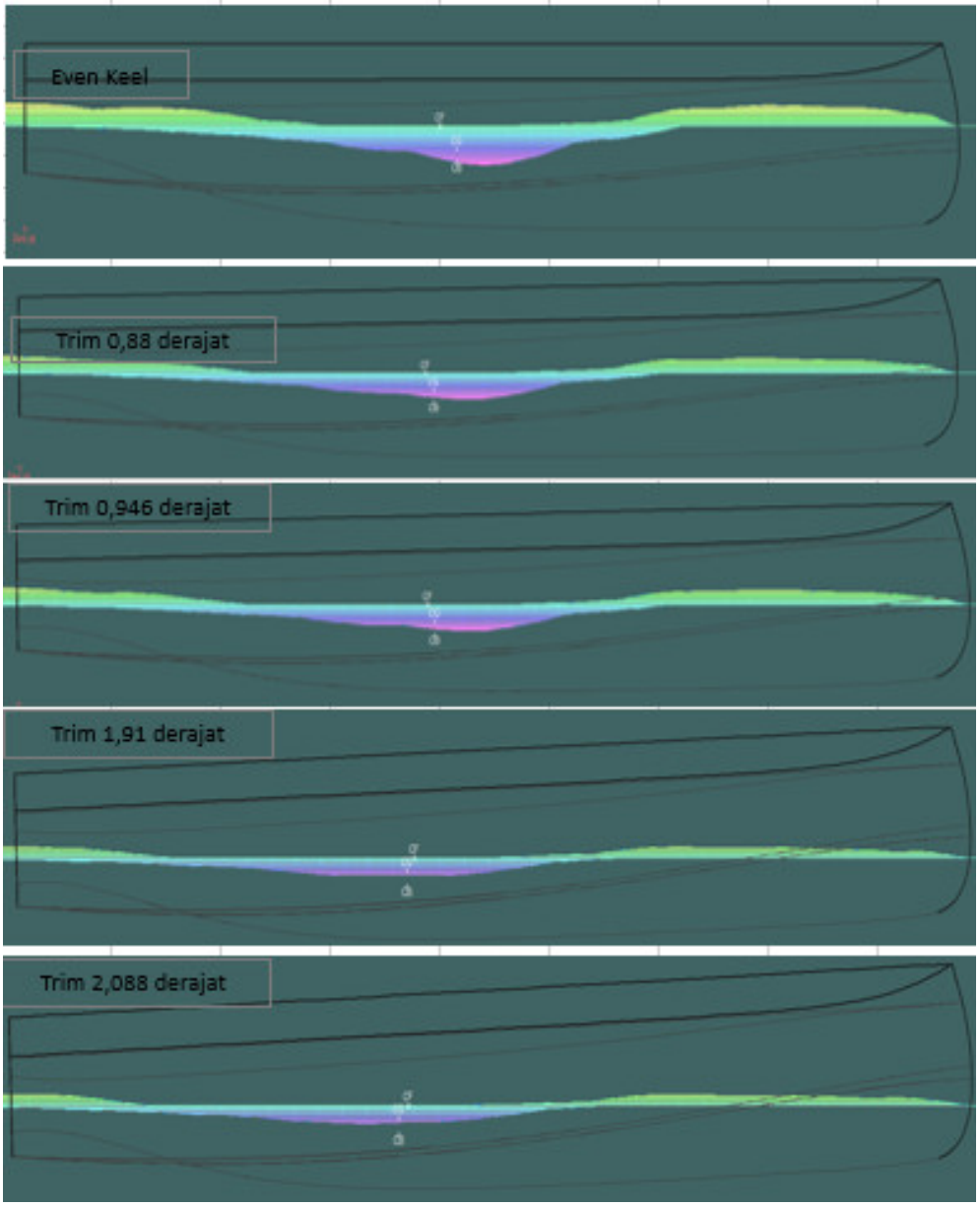
Loadcase 4 | Intact

	Heel to Starboard deg	-40,0	-30,0	-20,0	-10,0	0,0	10,0	20,0
1	GZ m	-3,131	-3,132	-2,984	-1,672	0,070	1,810	3,116
2	Area under GZ curve from zero he	94,6218	63,3942	32,1796	8,0910	0,1279	9,4904	34,9400
3	Displacement t	77,96	77,96	77,96	77,97	77,96	77,96	77,96
4	Draft at FP m	-0,847	-0,051	0,569	0,873	0,955	0,872	0,569
5	Draft at AP m	0,517	1,176	1,715	1,842	1,839	1,843	1,715
6	Trim (+ve by stern) m	1,364	1,227	1,145	0,969	0,885	0,971	1,147
7	WL Length m	24,305	24,304	24,304	24,301	24,254	24,301	24,304
8	Beam max extents on WL m	3,967	4,173	7,357	7,881	7,749	7,882	7,357
9	Wetted Area m^2	126,912	125,324	135,607	163,421	167,954	163,406	135,606
10	Waterpl. Area m^2	60,851	58,354	66,050	88,629	90,637	88,625	66,049
11	Prismatic coeff. (Cp)	0,718	0,723	0,713	0,664	0,659	0,664	0,713
12	Block coeff. (Cb)	0,490	0,538	0,391	0,368	0,482	0,368	0,391
13	LCB from zero pt. (+ve fwd) m	9,715	9,736	9,762	9,779	9,781	9,776	9,760
14	LCF from zero pt. (+ve fwd) m	11,301	10,849	10,204	9,937	10,075	9,935	10,202
15	Max deck inclination deg	40,0632	30,0949	20,1542	10,2483	2,0884	10,2490	20,1545
16	Trim angle (+ve by stern) deg	3,2178	2,8952	2,7033	2,2883	2,0884	2,2920	2,7066

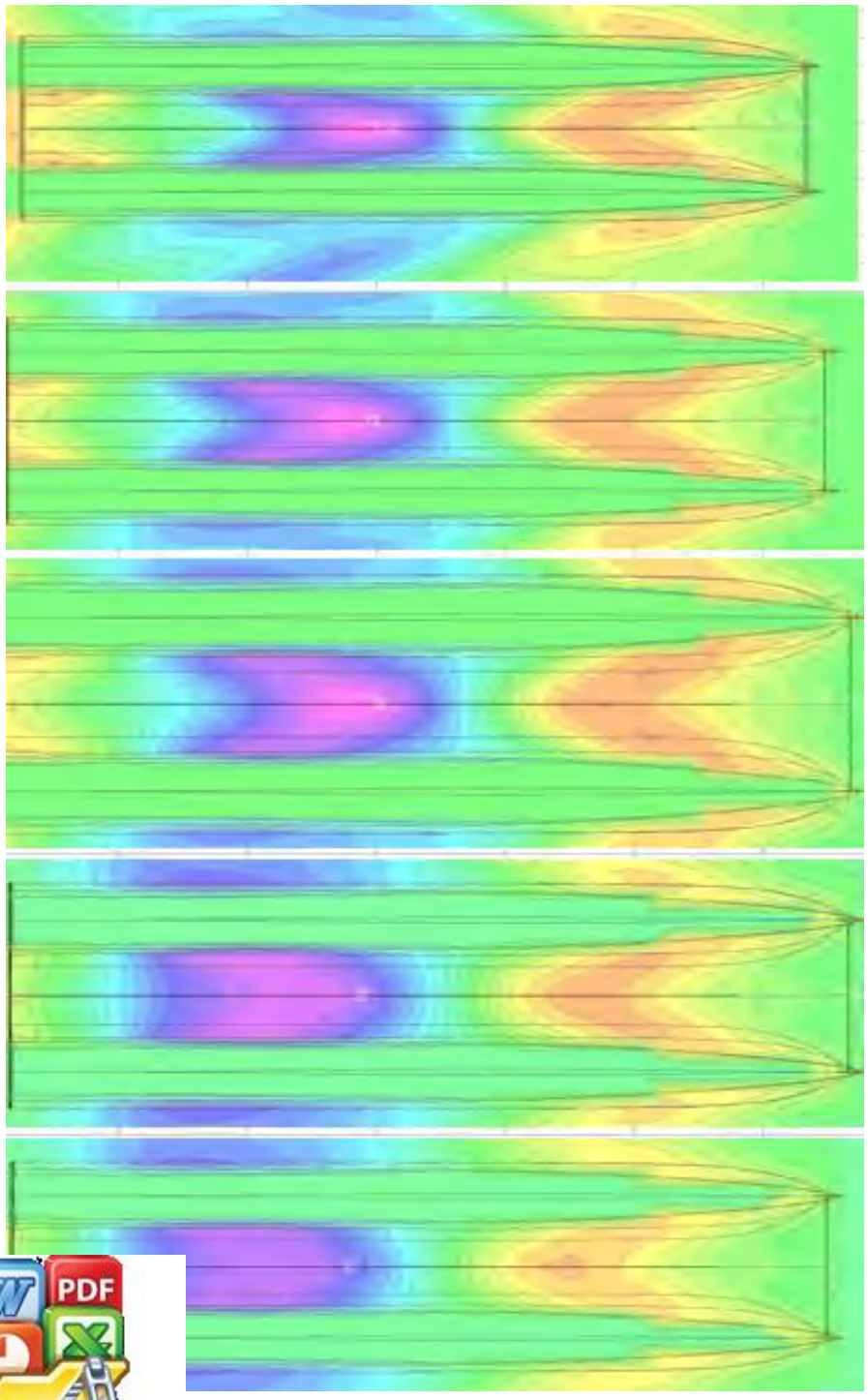
Lampiran 3. Kontur gelombang pada tiap kondisi kapal

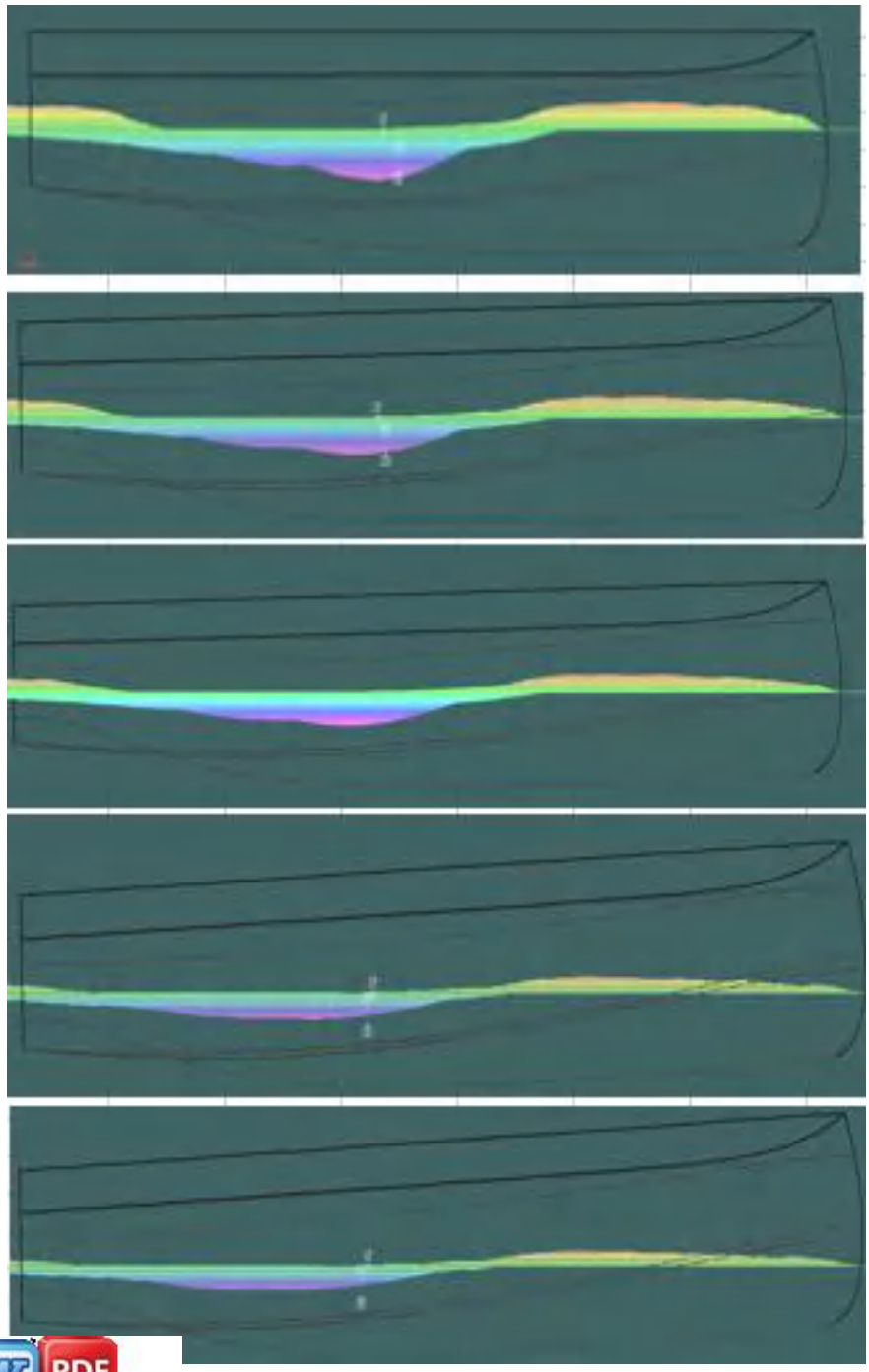
Kontur gelombang pada kecepatan 11 tampak atas dan tampak samping



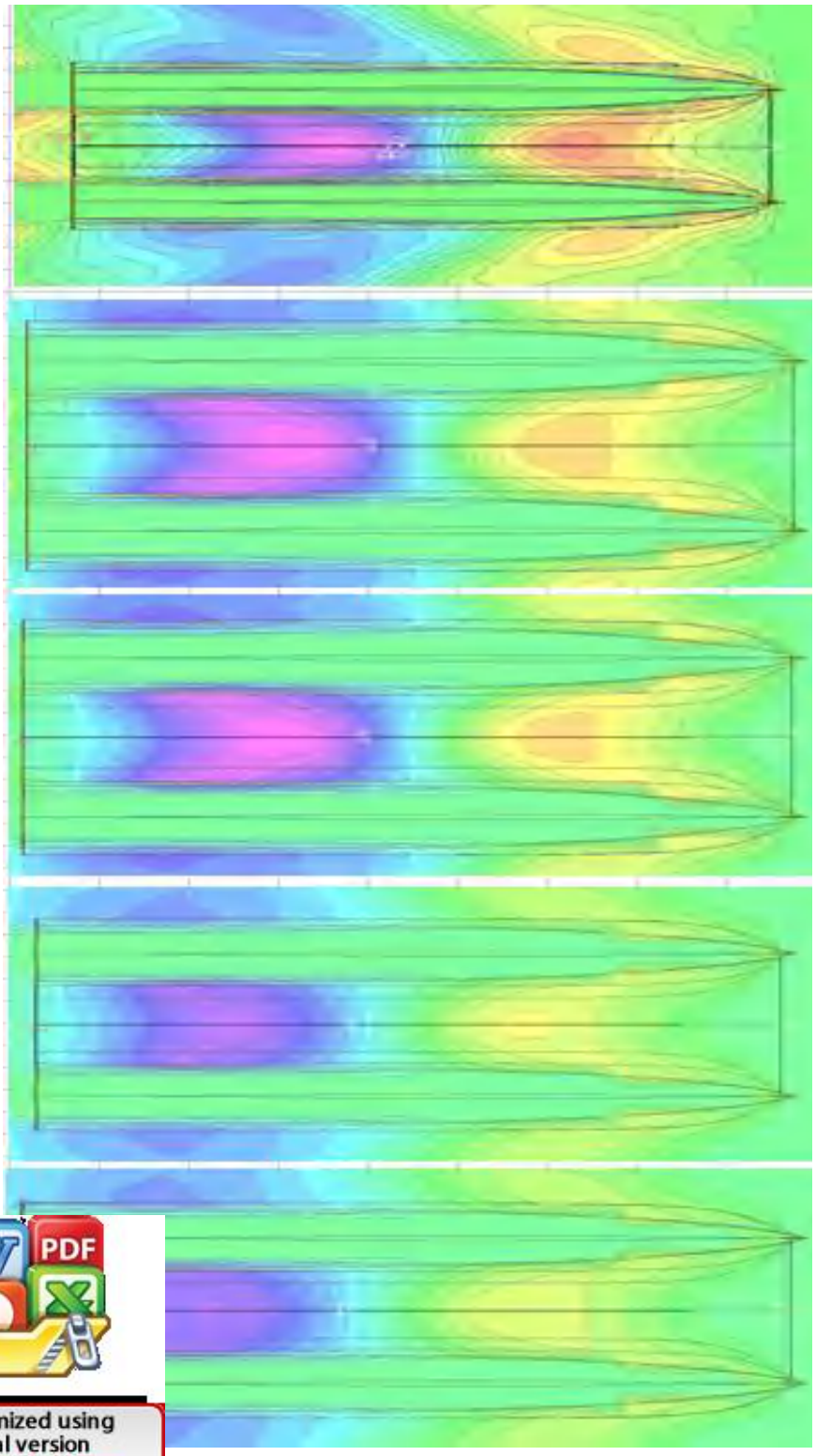


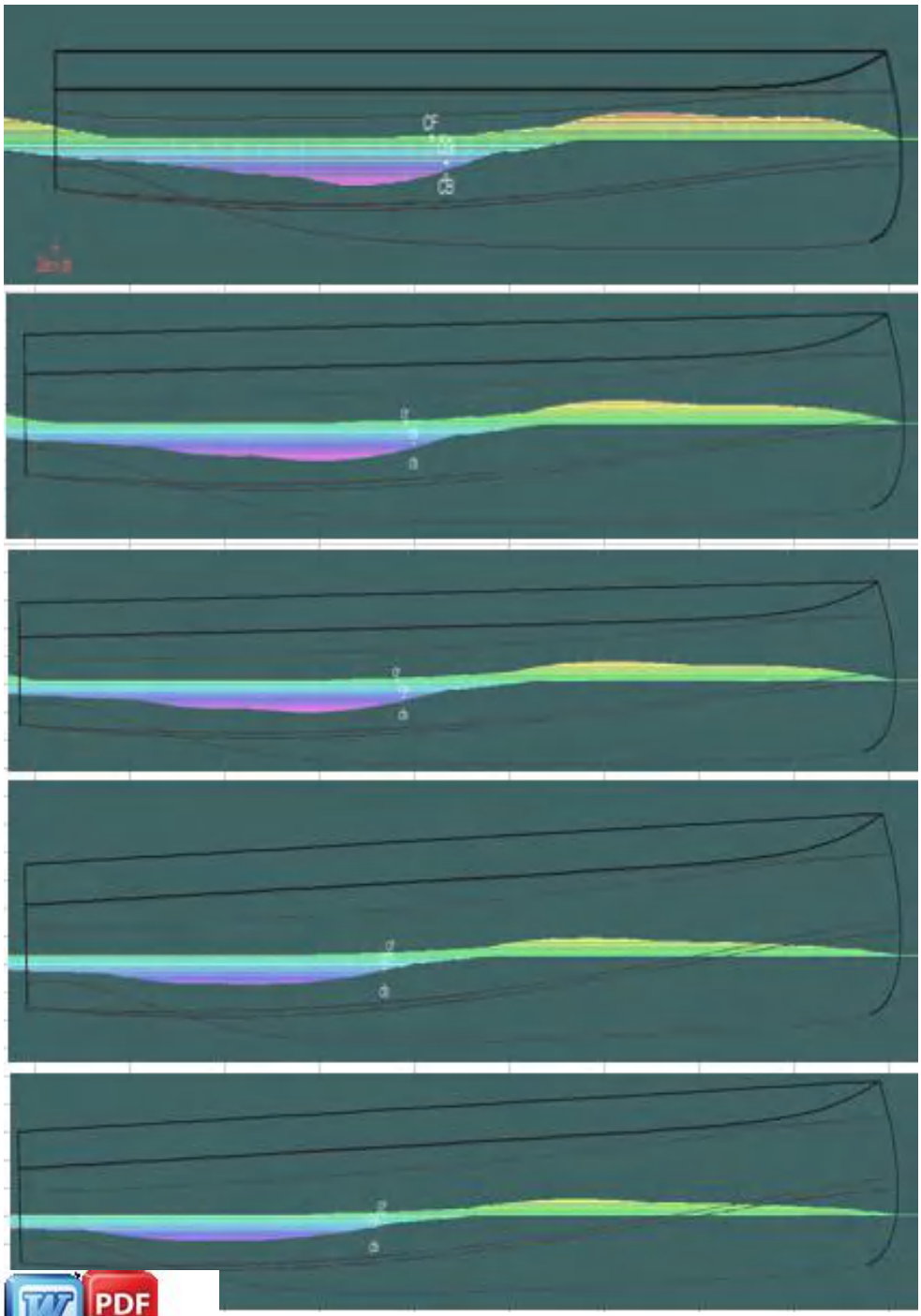
Kontur gelombang pada kecepatan 12 tampak atas dan tampak samping





Kontur gelombang pada kecepatan 13 tampak atas dan tampak samping





Kontur gelombang pada kecepatan 14 tampak atas dan tampak samping