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LAMPIRAN

Lampiran 1 Data tegangan dan arus saluran transmisi sistem Sulbagsel

No	Rute transmisi	CC	Teg (kV)	Panjang (kms)	Panjang (km)	Jenis konduktor
1	Tello - Tellolama	2	150	12,8	6,4	TACSR 330
2	Tello - Sungguminasa	2	150	21,86	10,93	ACSR 2x435
3	Sungguminasa- Tallasa	2	150	52,86	26,43	ACSR 2x435
4	Tello – Panakukang	2	150	8,4	4,2	BRUSSLES 415
5	Sungguminasa - Tanjung Bunga	2	150	23,8	11,9	ACSR 2x435
6	Sungguminasa- Bollangi	2	150	10,7	5,35	ACSR 2x435
7	Sungguminasa-Lanna	2	150	45,26	22,63	ACSR 2x250
8	Tello Lama - GIS Bontoala(SKTT)	2	150	9	4,5	XLPE/Cu 400
9	Tanjung Bunga- GIS Bontoala (SKTT)	2	150	22	11	N2XCK2Y 1x1000
10	Tello – Borongloe	1	70	12,4	6,2	ACSR 120
11	Tello Lama - Bontoala (SKTT)	2	70	8,4	4,2	XLPE/Cu 325
12	Pangkep -Bosowa	1	150	20,9	10,45	ACSR 240
13	Pangkep - Kima	1	150	36,6	18,3	ACSR 240
14	Kima – Tello	1	150	7,65	3,825	ACSR 240
15	Tello – Bosowa	1	150	20,9	10,45	ACSR 240
16	Pangkep -Tonasa III	2	70	7,4	3,7	ACSR 120
17	Pangkep-Mandai	2	70	79,4	39,7	ACCC HELSINKI160
18	Mandai – Daya	1	70	5	2,5	ACCC HELSINKI 160
19	Daya – Tello	1	70	14,6	7,3	ACCC HELSINKI 160
20	Tello – Mandai	1	70	14	7	ACCC HELSINKI 160
21	Pangkep - Barru	2	150	20	10	ACSR 240
22	Kima - Daya Baru	2	150	32,62	16,31	UGC, XPLE 1000
23	Daya Baru – Bollangi	2	150	7,38	3,69	ACSR 450
24	Daya Baru – Maros	2	150	7,38	3,69	ACSR 450
25	Bakaru –Pinrang	1	150	58,65	29,325	ACSR 240
26	Bakaru – Polmas	1	150	50,02	25,01	ACSR 240
27	Pare Pare –Polmas	1	150	91,1	45,55	ACSR 240
28	Pinrang - Pare Pare	1	150	26,06	13,03	ACSR 240
[illegible]	Pare Pare - Suppa	2	150	15	7,5	ACSR 240
[illegible]	Pare Pare – Ballusu	2	150	89,68	44,84	ACSR 240
[illegible]	Ballusu – Pangkep	2	150	89,68	44,84	ACSR 240

Lanjutan Lampiran 1

No	Rute transmisi	CC	Teg (kV)	Panjang (kms)	(km)	Jenis konduktor
31	Ballusu – Pangkep	2	150	89,68	44,84	ACSR 240
32	Barru EXT – PLTB Sidrap	2	150	75	37,675	ACSR 240
33	Barru EXT – Maros	2	150	237,98	118,99	ACSR 240
34	Pare Pare –Sidrap	2	150	35	17,5	ACSR 240
35	Sidrap –Soppeng	2	150	106,16	53,08	ACSR 240
36	Soppeng – Sengkang	2	150	71,16	35,58	ACSR 400
37	Siwa-Sengkang	2	150	132,17	66,085	HAWK 2x240
38	Sidrap - Makale	1	150	105,5	52,75	ACSR 433
39	Makale –Enrekang	1	150	53,44	26,72	ACSR 433
40	Sidrap – Enrekang	1	150	51,52	25,76	ACSR 433
41	Sengkang – Sidrap	2	150	124,66	62,33	ACSR 2x435
42	Sidrap – PLTB Sidrap	2	150	23,6	11,8	ACSR 2x435
43	Makale - Malea	2	150	-	-	ACSR 433
44	Makale – Rantepao	2	150	-	-	-
45	Bone –Bulukumba	1	150	137,2	68,6	ACSR 240
46	Bulukumba - Bantaeng Switching	2	150	7,3	3,65	ACSR 240
47	Jeneponto – Bantaeng New	1	150	23,4	11,7	ACSR 240
48	Punagaya – Jeneponto	2	150	62,14	31,07	ACSR 240
49	Tallasa –Punagaya	2	150	27	13,5	ACSR 2x435
50	Bulukumba – Tanete	1	150	-	-	ACSR 240
51	Sinjai - Tanete	1	150	-	-	ACSR 240
52	Punagaya – Tanjung Bunga	2	150	121,6	60,8	ACSR 2x450
53	Punagaya - PLTU Jeneponto	2	150	1,28	0,64	ACSR 2x435
54	Punagaya -PLTU Jeneponto Expansi	2	150	1,28	0,64	ACSR2x435
55	Jeneponto - PLTB Tolo	2	150	-	-	ACSR 240
56	Bantaeng Switch - Bantaeng Smelter	2	150	-	-	ACSR 240
57	Jeneponto – Bantaeng Switch	1	150	38,69	19,345	ACSR 240
58	Bantaeng Switch - Bantaeng New	1	150	15,51	7,755	ACSR 240
59	Bone – Sinjai	1	150	74	37,004	ACSR 240
60	Soppeng – Bone	2	150	87	43,322	ACSR 240
	Soppeng – Bengo	2	150	-	-	-
	Majene –Polmas	2	150	100,32	50,16	ACSR 240
	Majene –Mamuju	2	150	228,6	114,3	ACSR 240

Lanjutan lampiran 1

No	Rute transmisi	CC	Teg (kV)	Panjang		Jenis konduktor
				(kms)	(km)	
65	Mamuju Baru – PLTU Mamuju	2	150	14,62	7,31	ACSR 2x240
66	Mamuju Baru – Topoyo	2	150	110,28	55,14	ACSR 2x240
67	Topoyo Pasangkayu	2	150	1252,78	626,39	ACSR 240
68	Pasangkayu – Silae	2	150	175,92	87,96	ACSR 240
69	Silae – Sidera	2	150	57,78	28,89	ACSR 240
70	Sidera – Poso	2	150	285,14	142,57	HAWK 2x240
71	Sidera – Tallise	2	150	-	-	ACSR 240
72	Tallise 70 KV - Parigi 70 KV	2	70	87,4	43,7	ACSR 185
73	Tallise 70 KV – PLTU PJPP	1	70	-	-	ACSR 185
74	PLTU PJPP - Parigi 70 KV	1	70	-	-	ACSR 185
75	Palopo – Latupa	2	150	-	-	ACSR 240
76	Palopo – Belopa	2	150	48,96	24,48	ACSR 240
77	Palopo –Makale	2	150	74,8	37,4	ACSR 240
78	Belopa – Siwa	2	150	40,67	20,335	ACSR 240
79	Nii tanasa – Powatu 70 KV	2	70	25,4	12,7	ACCC HELSINKI 160
80	Powatu 150 KV - Kendari New	2	150	28,36	14,18	ACSR 2x240
81	Unaha - Kendari New	2	150	101,82	50,91	ACSR 2x240
82	Unaha – Kolaka	2	150	147,75	73,875	ACSR 2x240
83	Latuppa 275 KV – Pamona 275 KV	1	275	418	209	2 x ACSR
84	Latuppa 275 KV – Wotu 275 KV	1	275	187,23	93,615	2 x ACSR
85	Wotu 275 KV – Pamona 275KV	1	275	-	-	2 x ACSR
86	Wotu – Malili	2	150	93,09	46,545	ACSR 2x240
87	Wotu – Masamba	2	150	-	-	-
88	Malili – Lasusu	2	150	234,39	117,195	ACSR 2x240
89	Pamona – Sulewana	2	275	-	-	2 x ACSR
90	Pamona – Poso	2	150	87,2	43,6	HAWK 2x240
91	Kolaka – Wolo	2	150	-	-	ACSR2x240

Lampiran 2 Data impedansi saluran transmisi sistem Sulbagsel

No	Rute transmisi	Impedansi transmisi/km			
		Urutan positif/km		Urutan nol/km	
		R/km	JX/km	R0/km	JX0/km
1	Tello - Tello lama	0,091	0,373	0,283	0,862
2	Tello – Sungguminasa	0,037	0,280	0,189	0,872
3	Sungguminasa – Tallasa	0,037	0,246	0,188	0,911
4	Tello – Panakukang	0,093	0,371	0,321	0,980
5	Sungguminasa - Tanjung Bunga	0,68	0,398	0,238	0,909
6	Sungguminasa – Bollangi	0,032	0,269	0,222	1,138
7	Sungguminasa – Lanna	0,033	0,261	0,184	0,784
8	Tello Lama - GIS Bontoala (SKTT)	-	-	-	-
9	Tanjung Bunga - GIS Bontoala (SKTT)	0,029	0,128	0,177	0,388
10	Tello – Borongloe	0,240	0,813	0,600	2,000
11	Tello Lama – Bontoala (SKTT)	0,240	0,813	0,600	2,000
12	Pangkep – Bosowa	0,122	0,396	0,245	0,833
13	Pangkep – Kima	0,122	0,396	0,244	0,833
14	Kima – Tello	0,125	0,415	0,403	0,993
15	Tello – Bosowa	0,182	0,651	1,25	1,91
16	Pangkep - Tonasa III	0,240	0,813	0,600	2,00
17	Pangkep – Mandai	0,232	0,394	0,418	1,143
18	Mandai – Daya	0,240	0,813	0,606	2,000
19	Daya – Tello	0,180	0,363	0,433	1,068
20	Tello – Mandai	-	-	-	-
21	Pangkep – Barru	0,122	0,396	0,245	0,833
22	Kima - Daya Baru	0,023	0,155	0,077	0,077
23	Daya Baru – Bollangi	0,037	0,260	0,169	0,672
24	Daya Baru – Maros	0,037	0,260	0,169	0,672
25	Bakaru – Pinrang	0,118	0,423	0,267	1,289
26	Bakaru – Polmas	0,118	0,425	0,266	1,274
27	Pare Pare – Polmas	0,118	0,424	0,814	1,243
28	Pinrang - Pare Pare	0,124	0,410	0,317	1,006
29	Pare Pare – Suppa	0,117	0,409	0,329	1,009
30	Pare Pare – Ballusu	0,120	0,409	0,295	0,967
31	Ballusu – Pangkep	0,119	0,402	0,297	0,990
32	Barru EXT - PLTB Sidrap	0,122	0,396	0,245	0,833
33	Barru EXT – Maros	0,122	0,396	0,245	0,833
34	Pare Pare – Sidrap	0,137	0,436	0,311	1,121
	Sidrap – Soppeng	0,122	0,405	0,236	0,873
	Soppeng – Sengkang	0,072	0,370	0,150	0,500

Lanjutan Lampiran 2

No	Rute transmisi	Impedansi transmisi/km			
		Urutan positif/km		Urutan nol/km	
		R/km	JX/km	R0/km	JX0/km
37	Siwa-Sengkang	0,033	0,261	0,184	0,784
38	Sidrap – Makale	0,073	0,390	0,189	0,931
39	Makale – Enrekang	0,073	0,394	0,189	0,930
40	Sidrap – Enrekang	0,073	0,394	0,189	0,931
41	Sengkang – Sidrap	0,035	0,288	0,237	1,218
42	Sidrap - PLTB Sidrap	0,039	0,308	0,215	0,917
43	Makale – Malea	0,073	0,390	0,189	0,931
44	Makale – Rantepao	-	-	-	-
45	Bone – Bulukumba	0,120	0,406	0,300	1,000
46	Bulukumba - Bantaeng Switching	0,120	0,406	0,300	1,000
47	Jeneponto - Bantaeng New	0,120	0,406	0,300	1,000
48	Punagaya – Jeneponto	0,117	0,396	0,293	0,975
49	Tallasa – Punagaya	0,033	0,274	0,226	1,161
50	Bulukumba – Tanete	0,120	0,406	0,300	1,000
51	Sinjai – Tanete	0,120	0,406	0,300	1,000
52	Punagaya - Tanjung Bunga	0,037	0,260	0,169	0,672
53	Punagaya - PLTU Jeneponto	0,037	0,260	0,169	0,672
54	Punagaya - PLTU Jeneponto Expansi	0,037	0,260	0,169	0,672
55	Jeneponto - PLTB Tolo	0,122	0,396	0,245	0,833
56	Bantaeng Switch - Bantaeng Smelter	0,122	0,396	0,245	0,833
57	Jeneponto - Bantaeng Switch	0,122	0,396	0,245	0,833
58	Bantaeng Switch - Bantaeng New	0,122	0,396	0,245	0,833
59	Bone – Sinjai	0,122	0,410	0,299	0,959
60	Soppeng – Bone	0,119	0,385	0,285	0,917
61	Soppeng – Bengo	-	-	-	-
62	Majene – Polmas	0,122	0,396	0,245	0,833
63	Majene – Mamuju	0,122	0,396	0,245	0,833
64	Mamuju - Mamuju Baru	0,038	0,280	0,188	0,842
65	Mamuju Baru - PLTU Mamuju	0,038	0,280	0,188	0,842
66	Mamuju Baru – Topoyo	0,038	0,280	0,188	0,842
67	Topoyo – Pasangkayu	0,122	0,396	0,245	0,833
68	Pasangkayu – Silae	0,122	0,396	0,245	0,833
69	Silae – Sidera	0,122	0,396	0,245	0,833
	Sidera – Poso	0,033	0,261	0,184	0,784
	Sidera – Tallise	0,122	0,396	0,245	0,833
	Tallise 70 KV - Parigi 70 KV	0,122	0,396	0,245	0,833

Lanjutan Lampiran 2

No	Rute transmisi	Impedansi transmisi/km			
		Urutan positif/km		Urutan nol/km	
		R/km	JX/km	R0/km	JX0/km
73	Tallise 70 KV - PLTU PJPP	0,122	0,396	0,245	0,833
74	PLTU PJPP - Parigi 70 KV	0,122	0,396	0,245	0,833
75	Palopo – Latupa	0,122	0,396	0,245	0,833
76	Palopo – Belopa	0,122	0,396	0,245	0,833
77	Palopo – Makale	0,122	0,396	0,245	0,833
78	Belopa – Siwa	0,122	0,396	0,245	0,833
79	Nii tanasa - Powatu 70 KV	0,200	0,411	0,389	0,955
80	Powatu 150 KV – Kendari New	0,061	0,283	0,346	0,954
81	Unaha - Kendari New	0,063	0,284	0,247	0,865
82	Unaha – Kolaka	0,064	0,282	0,233	0,856
83	Latuppa 275 KV - Pamona	0,033	0,261	0,184	0,784
84	Latuppa 275 KV - Wotu 275 KV	0,033	0,261	0,184	0,784
85	Wotu 275 KV - Pamona 275 KV	0,033	0,261	0,184	0,784
86	Wotu – Malili	0,038	0,280	0,188	0,842
87	Wotu – Masamba	-	-	-	-
88	Malili – Lasusu	0,038	0,280	0,188	0,842
89	Pamona – Sulewana	0,033	0,261	0,184	0,784
90	Pamona – Poso	0,033	0,261	0,184	0,784
91	Kolaka – Wolo	0,064	0,282	0,233	0,856

Sumber: PT. PLN (Persero) UIKL Sulawesi

Lampiran 3 Instruksi program *Galactic Swarm Optimization* (GSO) pada Matlab

```
clear all;
close all;0
clc;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%Galactic Swarm Optimization - Copy protected by Venkataraman
Trials=50;
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%--Setting of Parameters and function begin--%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%
%--D--%%----EPmax-----%%----L1-------%%-----L2------%%---N---%%---
M--%%
dim=10;epochnumber=5;Iteration1=198;Iteration2=1000;PopSize=5;subp
op=10;
%dim=30;epochnumber=5;Iteration1=280;Iteration2=1500;PopSize=5;sub
pop=20;
%dim=50;epochnumber=9;Iteration1=250;Iteration2=1500;PopSize=5;sub
pop=20;
after = 0;

[losses_p,losses_q,Tegangan,P,Pl,Pg,Q,Ql,Qg,tb,fb,Pij,Qij,V,Del,Vn
ow,VR]=Newton_raphson(after ,after ,after);
lossesP_awal = losses_p;
xmin=1;xmax=91;  %cost function
vmin=xmin;
vmax=xmax;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%--Setting of Parameters and function end--%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

for sum=1:Trials
c1 = 2.05*rand;
c2 = 2.05*rand;
c3 = 2.05*rand;
c4 = 2.05*rand;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%Initialization of position and velocity vectors begins
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

for num=1:subpop
for p=1:PopSize

gal(num).particle(p).x = xmin + (xmax-xmin)*rand(dim,1);
gal(num).particle(p).cost = ESM(gal(num).particle(p).x);
gal(num).particle(p).v =  vmin + (vmax-vmin)*rand(dim,1);
gal(num).particle(p).pbest=xmin + (xmax-xmin)*rand(dim,1);
if ESM(gal(num).particle(p).x)<ESM(gal(num).particle(p).pbest)
gal(num).particle(p).pbest=gal(num).particle(p).x;

).particle(p).pbest_c=ESM(gal(num).particle(p).pbest);
```

```
gal(num).xgbest=gal(num).particle(1).pbest;
gal(num).cgbest=ESM(gal(num).xgbest);
gal(num).gbest=ESM(gal(num).xgbest);
for p=2:PopSize
if ESM(gal(num).particle(p).pbest)<gal(num).cgbest
gal(num).xgbest=gal(num).particle(p).pbest;
gal(num).cgbest=ESM(gal(num).particle(p).pbest);
end
end
end
galaxy_x=gal(1).xgbest;
galaxy_c=ESM(galaxy_x);
for num=2:subpop
if ESM(gal(num).xgbest)<galaxy_c
galaxy_x=gal(num).xgbest;
galaxy_c=ESM(gal(num).xgbest);
end
end
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%Initialization of position and velocity vector ends
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
count_f=0;        %Initialization of counter for function calls
for epoch=1:epochnumber

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%-----------Level 1-----------
%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
for num=1:subpop
for r=0:Iteration1
for p=1:PopSize

r1 = -1+2*rand;
r2 = -1+2*rand;
v = c1*r1*(gal(num).particle(p).pbest - gal(num).particle(p).x) +
c2*r2*(gal(num).xgbest - gal(num).particle(p).x);
gal(num).particle(p).v = (1-
r/(Iteration1+1))*gal(num).particle(p).v + v;
gal(num).particle(p).v = max(gal(num).particle(p).v,vmin);
gal(num).particle(p).v = min(gal(num).particle(p).v,vmax);
gal(num).particle(p).x = gal(num).particle(p).x
+gal(num).particle(p).v;
gal(num).particle(p).x  = max(gal(num).particle(p).x ,xmin);
gal(num).particle(p).x  = min(gal(num).particle(p).x ,xmax);
gal(num).particle(p).cost = ESM(gal(num).particle(p).x);
count_f=count_f+1;
if gal(num).particle(p).cost < gal(num).particle(p).pbest_c
gal(num).particle(p).pbest = gal(num).particle(p).x;
gal(num).particle(p).pbest_c = gal(num).particle(p).cost;
if gal(num).particle(p).pbest_c < gal(num).cgbest
gal(num).xgbest = gal(num).particle(p).pbest;
gal(num).cgbest = gal(num).particle(p).pbest_c;
if gal(num).cgbest < galaxy_c
x = gal(num).xgbest;
c = gal(num).cgbest;
```

```
end
end
end
end
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%------Level 2--------------
%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
for p=1:subpop
particle(p).x = gal(p).xgbest;
particle(p).cost = gal(p).cgbest;
particle(p).pbest=particle(p).x;
particle(p).pbest_c=gal(p).cgbest;
particle(p).v=particle(p).x;
end

for r=0:Iteration2
for p=1:subpop

r3 = -1+2*rand;
r4 = -1+2*rand;
v =  c3*r3*(particle(p).pbest - particle(p).x)+ c4*r4*(galaxy_x -
particle(p).x);
particle(p).v = (1-r/(Iteration2+1))*particle(p).v + v;

particle(p).v = max(particle(p).v,vmin);

particle(p).v = min(particle(p).v,vmax);
particle(p).x = particle(p).x +particle(p).v;
particle(p).x = max(particle(p).x,xmin);
particle(p).x = min(particle(p).x,xmax);

particle(p).cost = ESM(particle(p).x);
count_f=count_f+1;

if particle(p).cost < particle(p).pbest_c
particle(p).pbest = particle(p).x;
particle(p).pbest_c = particle(p).cost;

if particle(p).pbest_c < galaxy_c
galaxy_x = particle(p).pbest;
galaxy_c = particle(p).pbest_c;
end
end
end
end
%fprintf('\n Epoch=%d objfun_val=%e',epoch, galaxy_c);
end
end
place = round(galaxy_x);
%place = max(round(galaxy_x))
%fprintf('\n f=%s Trial=%d objfun_val=%e',funct,sum,galaxy_c);
after = 1;
       =round(place);
       round(place(1));
       size = fobj(round(place));
```

```
[Loss_P_BESS,Loss_Q_BESS,Tegangan_BESS,P_BESS,Pl_BESS,Pg_BESS,Q_BE
SS,Ql_BESS,Qg_BESS,fb,tb,Pij_BESS,Qij_BESS,V_BESS,Del_BESS,Vnow_BE
SS,VR_BESS]=Newton_raphson(after,place, optimalsize);
%Loss_P_BESS(isinf(Loss_P_BESS)|isnan(Loss_P_BESS)) = 0;
%Loss_P_BESS(isinf(Loss_P_BESS)|isnan(Loss_P_BESS)) = 0;

a = linspace(1,max(losses_p));
a = a(1:length(a)-3);
a = a';
%[P_loss_bess,Q_loss_bess] = fobj_battery(optimalsize );
%for h = P_loss_bess(1):P_loss_bess(end)
%losses_q(place) = P_loss_bess;
%losses_p(place) = Q_loss_bess;
%end
%losses_p = losses_p(1:91,:);
plot(a,(Loss_P_BESS./1e2),'b',a,(losses_p./1e2),'r');
disp('best place');
disp(place);
disp('best size');
disp(abs(optimalsize));
nb = 91;
nl=91;
clear sum;
```