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Applications of Parallel and Distributed Processing

MOHAMMAD SHAHIDEHPOUR
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Appendix A

Example System Data

A.1 PARTITIONING OF THE IEEE 118-BUS SYSTEM

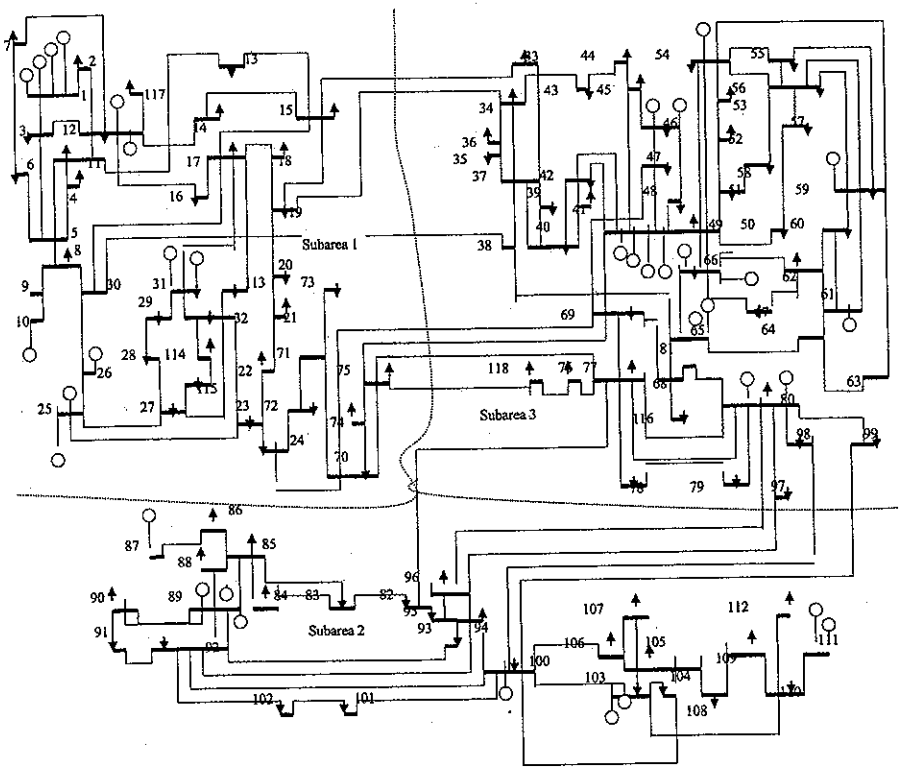


Figure A.1 IEEE 118-bus System Subarea Partitions

A.2 PARAMETERS OF THE IEEE 118-BUS SYSTEM

Table A.1 Line Data of the IEEE 118-Bus System

Line	From Bus	To Bus	*R* (p.u.)	*X* (p.u.)	Line	From Bus	To Bus	*R* (p.u.)	*X* (p.u.)
1	1	2	0.0303	0.0999	47	35	37	0.011	0.0497
2	1	3	0.0129	0.0424	48	33	37	0.0415	0.142
3	4	5	0.0018	0.008	49	34	36	0.0087	0.0268
4	3	5	0.0241	0.108	50	34	37	0.0026	0.0094
5	5	6	0.0119	0.054	51	38	37	0	0.0375
6	6	7	0.0046	0.0208	52	37	39	0.0321	0.106
7	8	9	0.0024	0.0305	53	37	40	0.0593	0.168
8	8	5	0	0.0267	54	30	38	0.0046	0.054
9	9	10	0.0026	0.0322	55	39	40	0.0184	0.0605
10	4	11	0.0209	0.0688	56	40	41	0.0145	0.0487
11	5	11	0.0203	0.0682	57	40	42	0.0555	0.183
12	11	12	0.006	0.0196	58	41	42	0.041	0.135
13	2	12	0.0187	0.0616	59	43	44	0.0608	0.2454
14	3	12	0.0484	0.16	60	34	43	0.0413	0.1681
15	7	12	0.0086	0.034	61	44	45	0.0224	0.0901
16	11	13	0.0223	0.0731	62	45	46	0.04	0.1356
17	12	14	0.0215	0.0707	63	46	47	0.038	0.127
18	13	15	0.0744	0.2444	64	46	48	0.0601	0.189
19	14	15	0.0595	0.195	65	47	49	0.0191	0.0625
20	12	16	0.0212	0.0834	66	42	49	0.0715	0.323
21	15	17	0.0132	0.0437	67	42	49	0.0715	0.323
22	16	17	0.0454	0.1801	68	45	49	0.0684	0.186
23	17	18	0.0123	0.0505	69	48	49	0.0179	0.0505
24	18	19	0.0112	0.0493	70	49	50	0.0267	0.0752
25	19	20	0.0252	0.117	71	49	51	0.0486	0.137
26	15	19	0.012	0.0394	72	51	52	0.0203	0.0588
27	20	21	0.0183	0.0849	73	52	53	0.0405	0.1635
28	21	22	0.0209	0.097	74	53	54	0.0263	0.122
29	22	23	0.0342	0.159	75	49	54	0.073	0.289
30	23	24	0.0135	0.0492	76	49	54	0.0869	0.291
31	23	25	0.0156	0.08	77	54	55	0.0169	0.0707
32	26	25	0	0.0382	78	54	56	0.0027	0.0095
33	25	27	0.0318	0.163	79	55	56	0.0049	0.0151
34	27	28	0.0191	0.0855	80	56	57	0.0343	0.0966
35	28	29	0.0237	0.0943	81	50	57	0.0474	0.134
36	30	17	0	0.0388	82	56	58	0.0343	0.0966
37	8	30	0.0043	0.0504	83	51	58	0.0255	0.0719
38	26	30	0.008	0.086	84	54	59	0.0503	0.2293
39	17	31	0.0474	0.1563	85	56	59	0.0825	0.251
40	29	31	0.0108	0.0331	86	56	59	0.0803	0.239
41	23	32	0.0317	0.1153	87	55	59	0.0474	0.2158
42	31	32	0.0298	0.0985	88	59	60	0.0317	0.145
43	27	32	0.0229	0.0755	89	59	61	0.0328	0.15
44	15	33	0.038	0.1244	90	60	61	0.0026	0.0135
45	19	34	0.0752	0.247	91	60	62	0.0123	0.0561
46	35	36	0.0022	0.0102	92	61	62	0.0082	0.0376

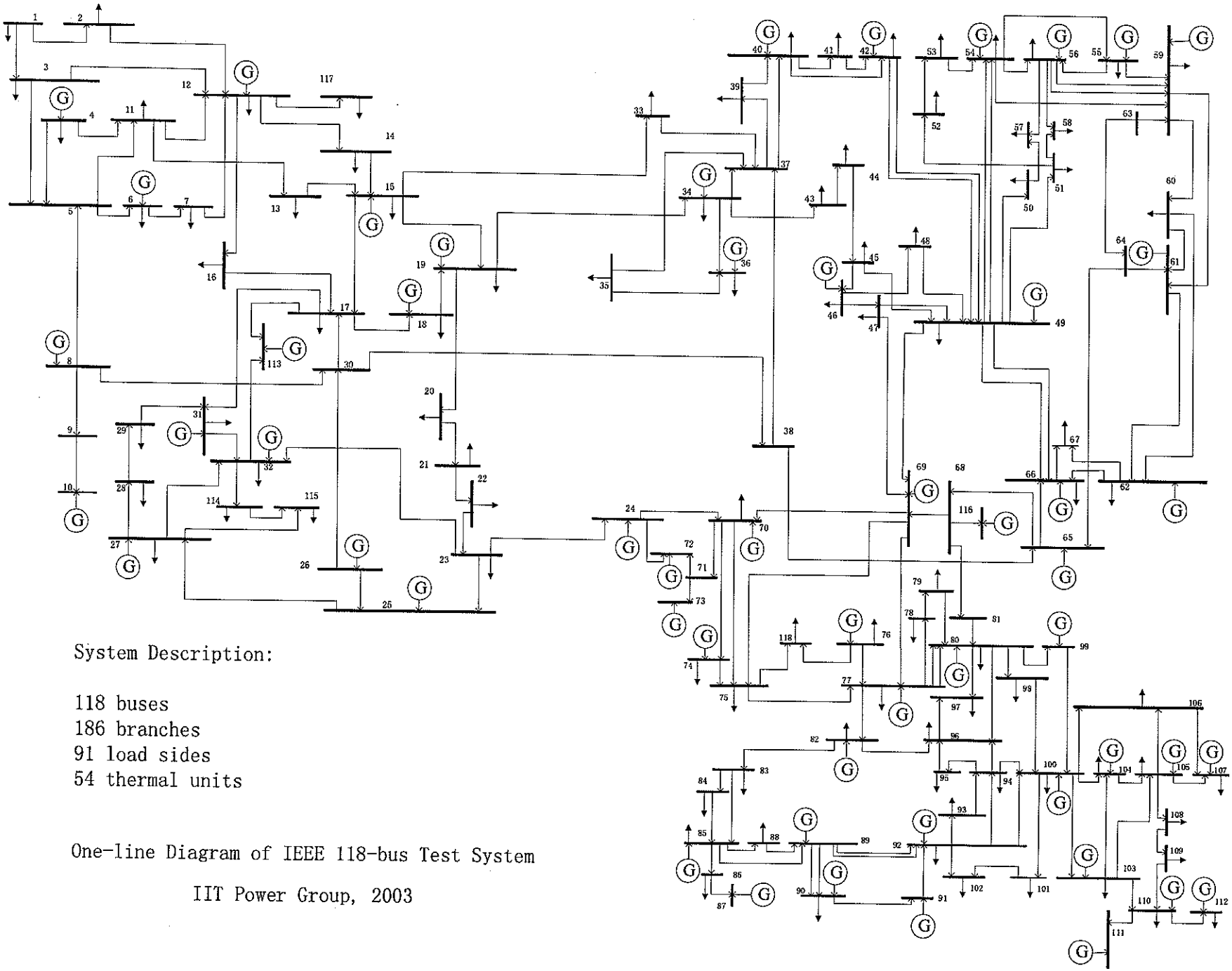
Table A.1 Line Data of the IEEE118-Bus System (Continued)

Line	From Bus	To Bus	R (p.u.)	X (p.u.)	Line	From Bus	To Bus	R (p.u.)	X (p.u.)
93	63	59	0	0.0386	140	90	91	0.0254	0.0836
94	63	64	0.0017	0.02	141	89	92	0.0099	0.0505
95	64	61	0	0.0268	142	89	92	0.0393	0.1581
96	38	65	0.009	0.0986	143	91	92	0.0387	0.1272
97	64	65	0.0027	0.0302	144	92	93	0.0258	0.0848
98	49	66	0.018	0.0919	145	92	94	0.0481	0.158
99	49	66	0.018	0.0919	146	93	94	0.0223	0.0732
100	62	66	0.0482	0.218	147	94	95	0.0132	0.0434
101	62	67	0.0258	0.117	148	80	96	0.0356	0.182
102	65	66	0	0.037	149	82	96	0.0162	0.053
103	66	67	0.0224	0.1015	150	94	96	0.0269	0.0869
104	65	68	0.0014	0.016	151	80	97	0.0183	0.0934
105	47	69	0.0844	0.2778	152	80	98	0.0238	0.108
106	49	69	0.0985	0.324	153	80	99	0.0454	0.206
107	68	69	0	0.037	154	92	100	0.0648	0.295
108	69	70	0.03	0.127	155	94	100	0.0178	0.058
109	24	70	0.0022	0.4115	156	95	96	0,0171	0.0547
110	70	71	0.0088	0.0355	157	96	97	0.0173	0.0885
111	24	72	0.0488	0.196	158	98	100	0.0397	0.179
112	71	72	0.0446	0.18	159	99	100	0.018	0.0813
113	71	73	0.0087	0.0454	160	100	101	0.0277	0.1262
114	70	74	0.0401	0.1323	161	92	102	0.0123	0.0559
115	70	75	0.0428	0.141	162	101	102	0.0246	0.112
116	69	75	0.0405	0.122	163	100	103	0.016	0.0525
117	74	75	0.0123	0.0406	164	100	104	0.0451	0.204
118	76	77	0.0444	0.148	165	103	104	0.0466	0.1584
119	69	77	0.0309	0.101	166	103	105	0.0535	0.1625
120	75	77	0.0601	0.1999	167	100	106	0.0605	0.229
121	77	78	0.0038	0.0124	168	104	105	0.0099	0.0378
122	78	79	0.0055	0.0244	169	105	106	0.014	0.0547
123	77	80	0.017	0.0485	170	105	107	0.053	0.183
124	77	80	0.0294	0.105	171	105	108	0.0261	0.0703
125	79	80	0.0156	0.0704	172	106	107	0.053	0.183
126	68	81	0.0018	0.0202	173	108	109	0.0105	0.0288
127	81	80	0	0.037	174	103	110	0.0391	0.1813
128	77	82	0.0298	0.0853	175	109	110	0.0278	0.0762
129	82	83	0.0112	0.0366	176	110	111	0.022	0.0755
130	83	84	0.0625	0.132	177	110	112	0.0247	0.064
131	83	85	0.043	0.148	178	17	113	0.0091	0.0301
132	84	85	0.0302	0.0641	179	32	113	0.0615	0.203
133	85	86	0.035	0.123	180	32	114	0.0135	0.0612
134	86	87	0.0283	0.2074	181	27	115	0.0164	0.0741
135	85	88	0.02	0.102	182	114	115	0.0023	0.0104
136	85	89	0.0239	0.173	183	68	116	0.0003	0.0041
137	88	89	0.0139	0.0712	184	12	117	0.0329	0.14
138	89	90	0.0518	0.188	185	75	118	0.0145	0.0481
139	89	90	0.0238	0.0997	186	76	118	0.0164	0.0544

A.3 BUS LOAD AND INJECTION DATA OF THE IEEE 118-BUS SYSTEM

Table A.2 Bus Load and Injection Data of the IEEE118-Bus System

Bus	Type	P_d	Q_d	P_g	Q_g	Bus	Type	P_d	Q_d	P_g	Q_g
1	2	51	27	0	0	60	0	78	3	0	0
2	0	20	9	0	0	61	2	0	0	160	0
3	0	39	10	0	0	62	2	77	14	0	0
4	2	30	12	-9	0	63	0	0	0	0	0
5	0	0	0	0	0	64	0	0	0	0	0
6	2	52	22	0	0	65	2	0	0	391	0
7	0	19	2	0	0	66	2	39	18	392	0
8	2	0	0	-28	0	67	0	28	7	0	0
9	0	0	0	0	0	68	0	0	0	0	0
10	2	0	0	450	0	69	3	0	0	516.4	0
11	0	70	23	0	0	70	2	66	20	0	0
12	2	47	10	85	0	71	0	0	0	0	0
13	0	34	16	0	0	72	2	0	0	-12	0
14	0	14	1	0	0	73	2	0	0	-6	0
15	2	90	30	0	0	74	2	68	27	0	0
16	0	25	10	0	0	75	0	47	11	0	0
17	0	11	3	0	0	76	2	68	36	0	0
18	2	60	34	0	0	77	2	61	28	0	0
19	2	45	25	0	0	78	0	71	26	0	0
20	0	18	3	0	0	79	0	39	32	0	0
21	0	14	8	0	0	80	2	130	26	477	0
22	0	10	5	0	0	81	0	0	0	0	0
23	0	7	3	0	0	82	0	54	27	0	0
24	2	0	0	-13	0	83	0	20	10	0	0
25	2	0	0	220	0	84	0	11	7	0	0
26	2	0	0	314	0	85	2	24	15	0	0
27	2	62	13	-9	0	86	0	21	10	0	0
28	0	17	7	0	0	87	2	0	0	4	0
29	0	24	4	0	0	88	0	48	10	0	0
30	0	0	0	0	0	89	2	0	0	607	0
31	2	43	27	7	0	90	2	78	42	-85	0
32	2	59	23	0	0	91	2	0	0	-10	0
33	0	23	9	0	0	92	2	65	10	0	0
34	2	59	26	0	0	93	0	12	7	0	0
35	0	33	9	0	0	94	0	30	16	0	0
36	2	31	17	0	0	95	0	42	31	0	0
37	0	0	0	0	0	96	0	38	15	0	0
38	0	0	0	0	0	97	0	15	9	0	0
39	0	27	11	0	0	98	0	34	8	0	0
40	2	20	23	-46	0	99	2	0	0	-42	0
41	0	37	10	0	0	100	2	37	18	252	0
42	2	37	23	-59	0	101	0	22	15	0	0
43	0	18	7	0	0	102	0	5	3	0	0
44	0	16	8	0	0	103	2	23	16	40	0
45	0	53	22	0	0	104	2	38	25	0	0
46	2	28	10	19	0	105	2	31	26	0	0
47	0	34	0	0	0	106	0	43	16	0	0
48	0	20	11	0	0	107	2	28	12	-22	0
49	2	87	30	204	0	108	0	2	1	0	0
50	0	17	4	0	0	109	0	8	3	0	0
51	0	17	8	0	0	110	2	39	30	0	0
52	0	18	5	0	0	111	2	0	0	36	0
53	0	23	11	0	0	112	2	25	13	-43	0
54	2	113	32	48	0	113	2	0	0	-6	0
55	2	63	22	0	0	114	0	8	3	0	0
56	2	84	18	0	0	115	0	22	7	0	0
57	0	12	3	0	0	116	2	0	0	-184	0
58	0	12	3	0	0	117	0	20	8	0	0
59	2	277	113	155	0	118	0	33	15	0	0



System Description:

118 buses
186 branches
91 load sides
54 thermal units

One-line Diagram of IEEE 118-bus Test System

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