

MEEN 673

Test 2

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Problem 1:

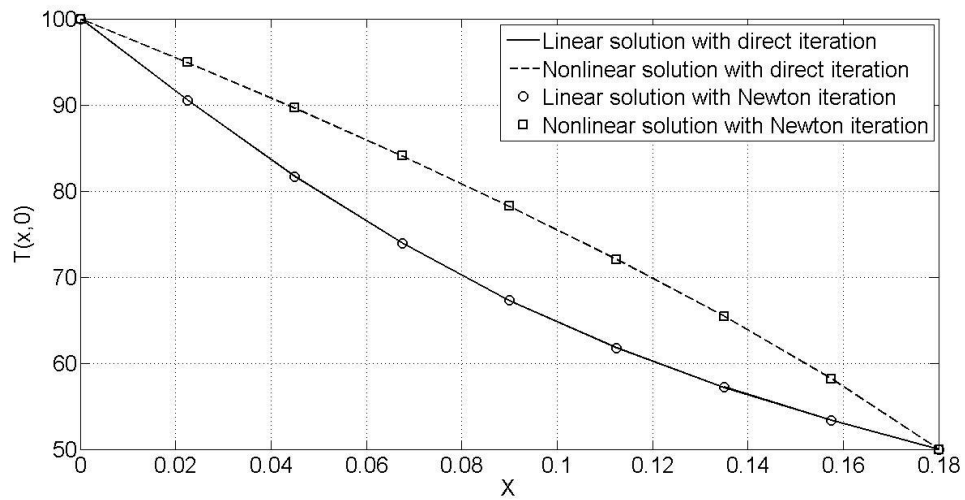


Figure 1.1 Temperature on the center line, $T(x,0)$ versus X .

(a) Direct iteration.

Table 1.1 Numerical results with direct iteration

x	y	T (linear)	T (nonlinear)
0.00000	0.00000	100.00000	100.00000
0.02250	0.00000	90.54000	94.92800
0.04500	0.00000	81.69200	89.62400
0.06750	0.00000	73.92000	84.07800
0.09000	0.00000	67.29800	78.24800
0.11250	0.00000	61.76300	72.06700
0.13500	0.00000	57.18500	65.42900
0.15750	0.00000	53.38400	58.16900
0.18000	0.00000	50.00000	50.00000

(b) Newton's iteration.

Table 1.2 Numerical results with Newton's iteration

x	y	T (linear)	T (nonlinear)
0.00000	0.00000	100.00000	100.00000
0.02250	0.00000	90.54000	94.93100
0.04500	0.00000	81.69200	89.62900
0.06750	0.00000	73.92000	84.08300
0.09000	0.00000	67.29800	78.25200
0.11250	0.00000	61.76300	72.06700
0.13500	0.00000	57.18500	65.42600
0.15750	0.00000	53.38400	58.16500
0.18000	0.00000	50.00000	50.00000

Problem 2:

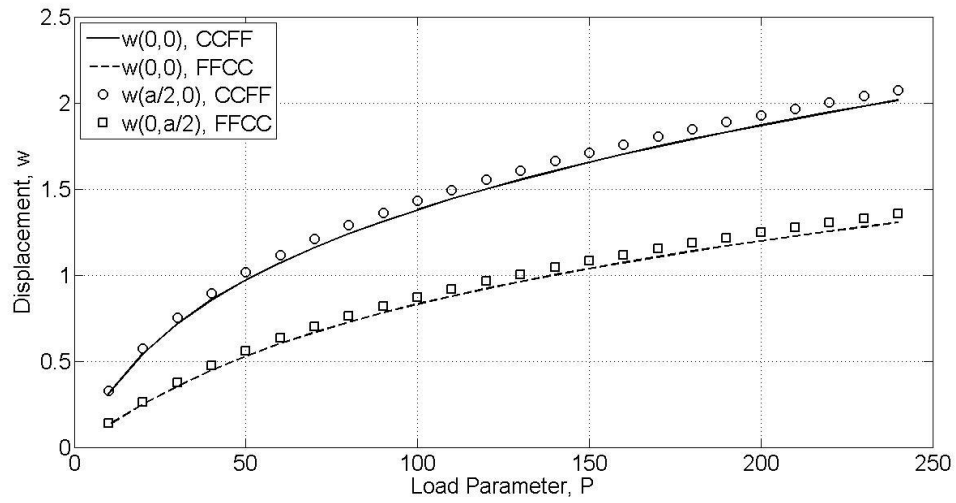


Figure 2.1 Displacements for CCFF plate and FFCC plate.

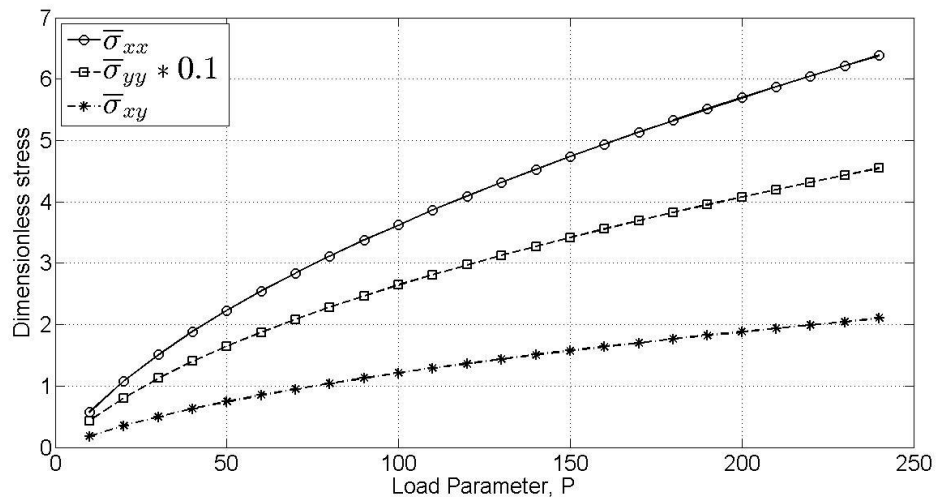


Figure 2.2 Dimensionless stresses at corner point for CCFF plate.

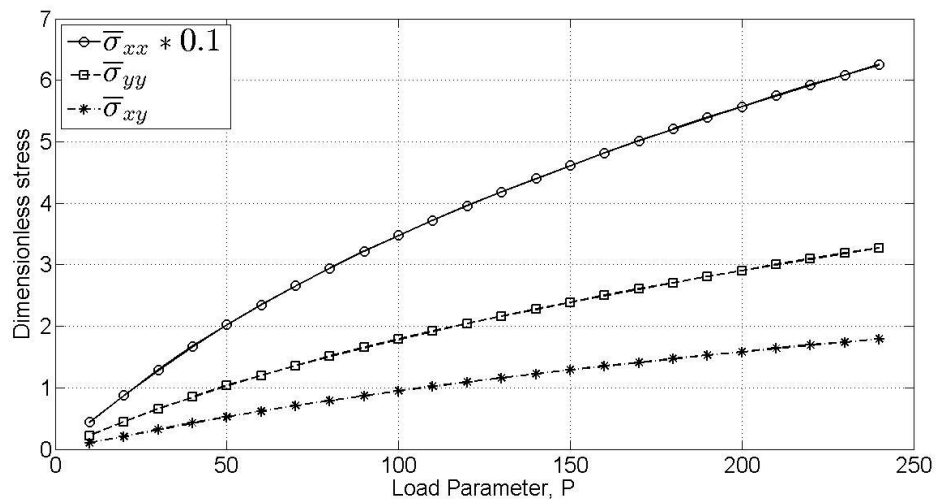


Figure 2.3 Dimensionless stresses at corner point for FFCC plate.

Table 2.1 Displacements of CCFF plate and FFCC plate.

	CCFF plate		FFCC plate	
Load, P	W(0,0)	W(a/2,0)	W(0,0)	W(0,a/2)
10	0.3094	0.3274	0.1288	0.1372
20	0.5423	0.5717	0.2482	0.2640
30	0.7167	0.7529	0.3543	0.3758
40	0.8554	0.8961	0.4473	0.4732
50	0.9713	1.0152	0.5290	0.5584
60	1.0713	1.1176	0.6017	0.6338
70	1.1598	1.2079	0.6670	0.7014
80	1.2394	1.2890	0.7263	0.7625
90	1.3120	1.3628	0.7806	0.8185
100	1.3788	1.4307	0.8308	0.8700
110	1.4410	1.4938	0.8774	0.9179
120	1.4991	1.5527	0.9211	0.9627
130	1.5537	1.6081	0.9621	1.0047
140	1.6054	1.6604	1.0009	1.0444
150	1.6545	1.7100	1.0377	1.0820
160	1.7012	1.7573	1.0726	1.1177
170	1.7459	1.8024	1.1060	1.1518
180	1.7887	1.8457	1.1380	1.1844
190	1.8298	1.8872	1.1686	1.2157
200	1.8694	1.9272	1.1980	1.2457
210	1.9075	1.9657	1.2264	1.2747
220	1.9444	2.0029	1.2538	1.3026
230	1.9799	2.0388	1.2802	1.3295
240	2.0148	2.0740	1.3058	1.3556

Table 2.2 Dimensionless stress at corner point of CCFF plate.

Load, P	$\bar{\sigma}_{xx}$	$\bar{\sigma}_{yy}$	$\bar{\sigma}_{xy}$
10	0.5715	4.2877	0.1830
20	1.0755	8.0506	0.3537
30	1.5062	11.2310	0.5009
40	1.8853	14.0030	0.6299
50	2.2278	16.4860	0.7458
60	2.5429	18.7540	0.8517
70	2.8366	20.8540	0.9498
80	3.1130	22.8200	1.0416
90	3.3750	24.6740	1.1283
100	3.6247	26.4340	1.2105
110	3.8638	28.1120	1.2890

120	4.0937	29.7200	1.3642
130	4.3153	31.2650	1.4365
140	4.5296	32.7540	1.5062
150	4.7372	34.1930	1.5735
160	4.9387	35.5870	1.6388
170	5.1347	36.9380	1.7022
180	5.3256	38.2520	1.7638
190	5.5117	39.5310	1.8237
200	5.6935	40.7770	1.8820
210	5.8711	41.9930	1.9385
220	6.0447	43.1810	1.9926
230	6.2141	44.3430	2.0417
240	6.3824	45.4800	2.1041

Table 2.3 Dimensionless stress at corner point of FFCC plate.

Load, P	$\bar{\sigma}_{xx}$	$\bar{\sigma}_{yy}$	$\bar{\sigma}_{xy}$
10	4.3801	0.2232	0.1008
20	8.7314	0.4445	0.2098
30	12.8510	0.6543	0.3189
40	16.6750	0.8498	0.4240
50	20.2130	1.0315	0.5236
60	23.4990	1.2010	0.6177
70	26.5670	1.3600	0.7067
80	29.4510	1.5100	0.7911
90	32.1750	1.6524	0.8714
100	34.7610	1.7880	0.9482
110	37.2260	1.9178	1.0218
120	39.5850	2.0424	1.0925
130	41.8490	2.1623	1.1607
140	44.0290	2.2781	1.2266
150	46.1320	2.3901	1.2903
160	48.1650	2.4987	1.3522
170	50.1360	2.6042	1.4123
180	52.0490	2.7068	1.4709
190	53.9080	2.8068	1.5279
200	55.7180	2.9043	1.5836
210	57.4820	2.9995	1.6380
220	59.2040	3.0925	1.6912
230	60.8860	3.1836	1.7433
240	62.5300	3.2727	1.7944