

FM 1590

J.H. MERKIN vol 35.3

The effect of buoyancy forces on the boundary layer flow over a semi-infinite vertical flat plate in a uniform free stream.

TABLE A

$$f_1''(0) = 1.621625$$

$$f_1 \rightarrow 1.564796$$

$$\theta_1'(0) = -0.383361$$

$$f_2''(0) = -1.269861$$

$$f_2 \rightarrow -2.809464$$

$$\bar{\theta}_2'(0) = 0.654362$$

z	f_1'	θ_1	f_2'	θ_2
0.00	0.000000	0.000000	0.000000	0.000000
0.2	0.285577	-0.076563	-0.252855	0.130782
0.4	0.498665	-0.151719	-0.367693	0.260380
0.6	0.646764	-0.222380	-0.727105	0.386091
0.8	0.737373	-0.284423	-0.928934	0.503876
1.0	0.778043	-0.333583	-1.093270	0.608576
1.2	0.776479	-0.366299	-1.210827	0.694223
1.4	0.740625	-0.380436	-1.274946	0.754702
1.6	0.678676	-0.375749	-1.282870	0.784840
1.8	0.598946	-0.353998	-1.236616	0.781706
2.0	0.509547	-0.318673	-1.143153	0.745702
2.2	0.417931	-0.274400	-1.013703	0.680996
2.4	0.330384	-0.226152	-0.862202	0.595043
2.6	0.251606	-0.178483	-0.703226	0.497275
2.8	0.184499	-0.134938	-0.549878	0.397371
3.0	0.130208	-0.097760	-0.412146	0.303631
3.5	0.045975	-0.036319	-0.166526	0.127563
4.0	0.012704	-0.010405	-0.051689	0.040766
4.5	0.002743	-0.002307	-0.012357	0.009967
5.0	0.000462	-0.000397	-0.002281	0.001873
5.5	0.000061	-0.000053	-0.000326	0.000272
6.0	0.000006	-0.000006	-0.000036	0.000030
6.5	0.000000	-0.000000	-0.000003	0.000003
7.0			-0.000000	0.000000

$$\phi_1''(0) = 0.082997$$

$$\bar{\theta}_1'(0) = -0.071176$$

$$\frac{1}{2}\bar{z} - \phi_1' \rightarrow 8.677749$$

$$\phi_2''(0) = 0.097441$$

$$\bar{\theta}_2'(0) = 0$$

$$\phi_2 \rightarrow 0.596490$$

\bar{z}	ϕ_1'	$\bar{\theta}_1'$	ϕ_2'	$\bar{\theta}_2'$	$\bar{\phi}_2'$	H_2
0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
0.2	0.16694	-0.014212	0.019481	0.000003	0.001997	0.001770
0.4	0.033953	-0.028133	0.038864	0.000037	0.003911	0.003487
0.6	0.052310	-0.041142	0.057900	0.000162	0.005650	0.005042
0.8	0.072208	-0.052467	0.076202	0.000438	0.007118	0.006306
1.0	0.093931	-0.061409	0.093296	0.000897	0.008241	0.007179
1.2	0.117556	-0.067513	0.108684	0.001530	0.008975	0.007614
1.4	0.142935	-0.070652	0.121922	0.002297	0.009313	0.007630
1.6	0.169715	-0.071012	0.132675	0.003139	0.009288	0.007295
1.8	0.197400	-0.069009	0.140750	0.003996	0.008957	0.006766
2.0	0.225413	-0.065188	0.146106	0.004820	0.008396	0.005965
2.5	0.293162	-0.051295	0.148427	0.006535	0.006464	0.003985
3.0	0.352202	-0.036455	0.138183	0.007562	0.004474	0.002385
3.5	0.399080	-0.024149	0.120247	0.007821	0.002875	0.001333
4.0	0.433696	-0.015205	0.099038	0.007381	0.001752	0.000713
5.0	0.473934	-0.005418	0.058744	0.005246	0.000584	0.000189
6.0	0.490702	-0.001748	0.030132	0.002950	0.000177	0.000048
7.0	0.496920	-0.000526	0.013763	0.001396	0.000051	0.000012
8.0	0.499037	-0.000150	0.005722	0.000582	0.000014	0.000003
10.0	0.499917	-0.000011	0.000795	0.000077	0.000001	0.000000
12.0	0.499994	-0.000001	0.000087	0.000008	0.000000	
14.0	0.500000	-0.000000	0.000006	0.000001		
15.0			0.000000	0.000000		