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LETTER TO THE EDITOR

Numerical results concerning the effect of anisotropic scattering on the critical-slab problem

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Abstract. The method of elementary solutions is used to deduce numerical results for the critical thickness of a multiplying slab in neutron-transport theory.

In a previous work Siewert and Williams (1977) used the Wiener–Hopf technique and the method of elementary solutions to solve the critical problem in neutron-transport theory for a scattering model that allowed a linear combination of backward, forward and isotropic scattering. Siewert and Williams (1977) also reported numerical results based on a numerical solution of a Fredholm integral equation. In a recent study Spiga and Vestrucci (1981) observed that the numerical results for some cases tabulated by Siewert and Williams (1977) were not accurate to the number of figures shown. We have confirmed that there was an error in the computer calculation reported earlier (Siewert and Williams 1977) and have subsequently resolved the same equations to find the corrected results given in table 1.

Table 1. The critical half-thickness for selected cases.

Case	α_0	β_0	$w(1, 0, 0)$	$w(0, 1, 0)$	$w(0, 0, 1)$	$w(\frac{1}{3}, \frac{1}{3}, \frac{1}{3})$	$w(\frac{2}{3}, \frac{1}{3}, 0)$	$w(0, \frac{2}{3}, \frac{1}{3})$	$w(\frac{1}{3}, 0, \frac{2}{3})$
1	0	1.01	8.3295	8.3295	8.3295	8.3295	8.3295	8.3295	8.3295
2	0.1	1.02	1.7945	1.9259	1.8658	1.8597	1.8350	1.9052	1.8414
3	0.2	1.03	1.0745	1.2134	1.1585	1.1450	1.1147	1.1944	1.1298
4	0.3	1.04	0.75337	0.88717	0.84563	0.82479	0.79010	0.87356	0.81475
5	0.4	1.06	0.55340	0.67549	0.65186	0.62414	0.58531	0.66968	0.62017
6	0.5	1.1	0.40897	0.51531	0.51196	0.47831	0.43550	0.51890	0.48057
7	0.6	1.2	0.28633	0.37055	0.38877	0.35143	0.30645	0.38427	0.35962
8	0.7	1.4	0.18584	0.24686	0.28206	0.24435	0.19975	0.26852	0.25675
9	0.8	1.6	0.12355	0.17209	0.21888	0.18099	0.13380	0.20038	0.19594
10	0.9	1.8	0.077114	0.11873	0.17739	0.13922	0.084708	0.15569	0.15608

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