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Erdős, Paul; Haley, S.B.; Marti, J.T.; Mennig, J.
A new method for the solution of the transport equation in slab geometry (In English)
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A new method, called the method of analytic angles, is developed for the solution of the transport equation (Boltzmann integro-differential equation) in slab geometry. The essence of the method is the discretization of the spatial variable accompanied by an analytic solution for the resulting difference equation with respect to the angular variable. This contrasts to other procedures, such as to the spherical harmonic, Wick-Chandrasekhar and Carlson's S_N-method, which are restricted to a finite number of values of the angular variable. Two examples have been worked out. One is the phonon transport in solids with randomly distributed scattering centers, where the numerical solution agrees very well with the asymptotic analytical solutions. The other example, a neutron transport problem, allows comparison with the S_N-method.

Classification:
65P05 Numerical methods for miscellaneous problems of PDE
82C70 Transport processes
76P05 Molecular or atomic structure