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Deterministic and other Methods Available to Solve the Maxwell-Boltzmann Transport Equation for Particles Scattered off of a Broad Slab with Thickness 'L' ERIC STEINFELDS, KEITH ANDREW, Western Kentucky University — Although the discussion and formulations shall be of a theoretical nature, it is intended that computations of solutions for the Maxwell Boltzmann (M.B.) transport equation be applied to benchmarks in nuclear engineering, simple (but not trivial) examples in medical physics, and even the scattering of light off of planetary surfaces. One can find planetary examples and theoretical inspiration from the text "Radiative Transfer" (©1950) by S. Chandrasekhar. The presentation shall start from the M.B. transport equation, proceed with mathematical methods to the corresponding integral equation, and continue with an iterative method for predicting the scattering of neutral particles off of a broad slab of material (with Tk='L'), where slab is in vacuum. The incoming beam need not be at the right angle. Chandrasekhar came up with the H-function to generate the solutions of scattered particles as a function of angle for a slab of infinite thickness. The analysis presented by the author shall be oriented to calculations of the particulate 'flux' within and off of a finite slab target. It will be presumed that the particles in the slab are isotropic scatterers, but the albedo (or 1−absorptiveness) are anywhere form 0 to 1.0. Results for the simulation of angles of escape might be shown.

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