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A review of how Thickness of a broad Plate and choice of Material (or Isotope) of this Plate effect the Attenuation, Transmission, and 'diffuse' Reflection of a Beam of Neutrons which enters this Plate[1] LARS HEBENSTIEL, ERIC STEINFELDS, Western Kentucky University — This computational investigation currently limits itself to nonfissionalble materials for the Target plate. We consider the scattering of neutrons on solid rectangular targets. It is standard to treat this problem using the Maxwell Boltzmann Transport Equation (MBTE) and to use symmetries to simplify the calculation. The solving of the MBTE has proven itself to be very difficult so solve analytically and even challenging with deterministic numerical approaches. Monte Carlos simulations of scattering of neutrons offer patterns of numerical solutions which can be statistically surmised for rectangular slabs and other target barriers. We offer a method in which first order isotropic scattering is calculated analytically. 2^{nd} order through 10^{th} order scattering are done semi-analytically with a skillful use of logs and polynomials to fit Exponential Integral (EI) functions. Although the MBTE by nature is a 5 variable equation, spherical phase symmetry of the n's makes it possible to simplify the MBTE into Fredholm integral equation of 2^{nd} kind. These deterministic calculations are compared to Monte Carlo simulations of scattered neutrons from corresponding targets of material.

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