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One-Dimensional, Time-Dependent Neutron Transport Benchmarks CAROL APLIN, DOUGLASS HENDERSON, University of Wisconsin — The interaction of fusion neutrons with the burning DT plasma influences the burn dynamics of high gain inertial fusion energy targets that will eventually be used for reactor applications. Neutron interactions are also an important diagnostic tool for nearer term ignition targets. In each case accurate time and spatially dependent reaction rates in the target and the spectrum of neutrons emerging from the target are important quantities to know so that computer simulations can be compared to experimental results. We are developing a code to solve the one-dimensional time-dependent integral form of the neutron transport equation using quasi-analytic methods. This code will be tested against benchmark problems to ascertain its accuracy and will be tested in the BUCKY 1-D radiation hydrodynamics code to test the suitability of integral transport methods for incorporation in IFE simulation codes. Previously, the code has been used to reproduce previous benchmark problems in infinite slab and spherical geometries. Further benchmark problems for finite slab and spherical geometries are under development.

Carol Aplin
University of Wisconsin

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