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Title: Prediction of Neutral Particle Analog Monte Carlo Computational Time with Discrete Ordinates

Abstract
Traditional Monte Carlo transport acceleration methods using variance reduction have employed the adjoint transport solution (importance function) to construct weight windows. In streaming problems that arise in shielding or nuclear nonproliferation, this approach often leads to an excessive amount of particle splitting causing inefficient calculations. Collaborators at Los Alamos National Laboratory have developed equations to predict the expected computational time of a transport calculation, the future time equation (FTE), which can be used in conjunction with the adjoint transport solution to improve the computational efficiency. The FTE solver has been implemented within the discrete ordinates module of the University of Michigan's general-purpose particle transport framework Hammer. Source terms are estimated using timers embedded in the Monte Carlo transport implementation and passed directly to the 2-D discrete ordinates solver. This allows users to automatically calculate the estimated computational cost surface of a 2-D Monte Carlo simulation and will support optimized variance reduction efforts.