APPLYING THE USACHEV–GURVICH METHOD TO ESTIMATE THE ADJOINT-WEIGHTED TALLIES VIA THE MONTE CARLO METHOD

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The Monte Carlo method for solving the neutron transport equation offers a significant advantage by nearly eliminating the need for physical and geometric approximations, thus enhancing solution accuracy. However, it faces challenges in computing bilinear functionals of the neutron flux and the neutron value function, which are crucial for certain analyses. Examples of these critical quantities include the lifetime of prompt neutrons and sensitivity coefficients for the effective multiplication factor [1]. The study employs the Usachev–Gurvich method to estimate the neutron value function, a variance reduction technique that improves simulation efficiency [2, 3, 4]. Verification of this method involves assessing convergence in problems with known analytical solutions.

References

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