Abstract

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Hammer: a student-driven radiation transport solver framework

Hammer, is a framework for radiation transport solvers that is student driven, written in object-oriented c++17, application agnostic, and capable of parallel computing. The goal has been to encapsulate some of the usability and flexibility of a production-level code while staying lightweight and maintaining the educational potential of an in-house, application-specific, research code. The primary application of Hammer is as a test bed for advanced Monte Carlo, deterministic and Hybrid techniques for solving a wide array of problems in radiation transport while targeting nuclear nonproliferation. Example problem spaces include advanced methods for source detector problems relevant in nuclear nonproliferation and safeguards, remote antineutrino reactor monitoring, and sensitivity analysis on nuclear data.