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# Development of a Time-Dependent Random Ray Method for High-Accuracy Neutron Flux Simulations

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The most essential quantity that characterises the behaviour of a nuclear reactor is the neutron flux. Especially for the simulation of its time-dependent behaviour, which is crucial for the safety assessment, relatively coarse simplifications are often applied to make the neutron transport equation accessible to numerical calculations. The presented work introduces a high-fidelity, time-dependent neutron transport solver based on the novel random ray method, a stochastical variation of the method of characteristics. So far, this approach has been tested for a positive reactivity insertion into a homogeneous, infinite model problem, and the obtained results matched those of the analytical solution. The random ray method has a firm potential to provide precise solutions for more complex transients, which shall be investigated in future studies.

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