Monte Carlo Simulation of Neutron Counters for Safeguard Applications

Abstract:
MCNP_PTA is a new Monte Carlo code for the simulation of neutron counters for nuclear safeguard applications developed at the Joint Research Centre (JRC) in Ispra (Italy). After some preliminary considerations outlining the general aspects involved in the computational modelling of neutron counters, this paper describes the specific details and approximations which make up the basis of the model implemented in the code. One of the major improvements allowed by the use of Monte Carlo simulation is a considerable reduction in both the experimental work and in the reference materials required for the calibration of the instruments. This new approach to the calibration of counters using Monte Carlo simulation techniques is also discussed.

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