P12

Probabilistic Approach Of Solving Burnup Problems

Kabiru Alhaji Bala; Muhammad Rabie Omar

School of Physics (USM), Universiti Sains Malaysia (USM)

kabala@student.usm.my,rabieomar@usm.my

ABSTRACT

This paper presents a new approach to solving burnup problems in a nuclear reaction by using a probabilistic method. Unlike traditional methods that rely on complex matrix exponential calculations, the proposed method tracs the time evolution of nuclide concentrations through probability distributions. The method is implemented in a C++ program named CNUCTRAN and verified against the Chebyshev Rational Approximation Method (CRAM). Numerical results for various nuclear reactions demonstrate the accuracy and efficiency of the probabilistic method, making it a promising alternative for simulating realistic nuclear reaction scenarios.