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МОДЕЛЮВАННЯ РОЗПОДІЛУ ПАЛИВА У ВНУТРІШНІЙ ШВИДКІЙ ЗОНІ ДВОЗОННОГО ПІДКРИТИЧНОГО ЯДЕРНОГО РЕАКТОРА

Представлено дослідження, направлені на оптимізацію паливного складу двозонного підкритичного ядерного реактора. У рамках даної роботи було виконано моделювання внутрішньої швидкої зони двозонного підкритичного реактора з гомогенним паливом у співвідношенні геометричних, матеріальних та економічних параметрів розглянутої системи. Продемонстровано можливість розділення внутрішньої зони підкритичних систем на підзони із різним складом палива. На основі представлених результатів може бути знайдено оптимальне співвідношення для об'ємів внутрішньої та зовнішньої підзон залежно від призначення використання такої підкритичної системи.

Ключові слова: підкритичні системи, метод Монте-Карло, розрахунок реактора, Монте-Карло код Serpent, оптимізація.

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МОДЕЛИРОВАНИЕ РАСПРЕДЕЛЕНИЯ ТОПЛИВА ВО ВНУТРЕННЕЙ БЫСТРОЙ ЗОНЕ ДВУХЗОННОГО ПОДКРИТИЧЕСКОГО ЯДЕРНОГО РЕАКТОРА

Представлены исследования направленные на оптимизацию топливного состава двухзонного подкритического ядерного реактора. В рамках данной работы были выполнены моделирования внутренней быстрой зоны двухзонного подкритического реактора с гомогенным топливом в отношении геометрических, материальных и экономических параметров рассмотренной системы. Продемонстрирована возможность разделения внутренней зоны подкритических систем на подзоны с разным составом топлива. На основе представленных результатов может быть найдено оптимальное соотношение для объемов внутренней и внешней подзон в зависимости от назначения использования такой подкритической системы.

Ключевые слова: подкритические системы, метод Монте-Карло, расчет реактора, Монте-Карло код Serpent, оптимизация.

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SIMULATION OF FUEL DISTRIBUTION IN THE INNER FAST ZONE FOR TWO-ZONE SUBCRITICAL REACTOR

Investigations aimed for the optimization of fuel compositions for two-zone subcritical reactor is considered. The study of inner fast zone for two-zone subcritical reactor with homogeneous fuel concerning the geometrical, material and economical characteristics was carried out within the scope of this paper. The possibility of dividing of the inner zone into subzones with different fuel for two-zone subcritical systems was shown. It is possible to find the optimal ratio for volume of outer subzone to volume of inner subzone depending on the purpose of using such a subcritical systems.

Keywords: subcritical systems, Monte Carlo method, reactor calculation, Monte Carlo code Serpent, optimization.

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