Contribution ID: **33** Type: 海报展示

快堆用多群燃耗数据库的制作与验证

摘要

为研制高准确度快堆用燃耗数据库并建立精细化、系统化的基准检验方法，本研究开发了 LIB_Convert 程序，结合通用燃耗数据库制作系统 GENDEPLIX，基于 CNAF 3.4 和 ENDF/B-Ⅷ.0 数据库，制作了适用于 CINDER90 程序的燃耗数据库 FRBurn.lib。然后以 TAKAHAMA-3 压水堆为对象，系统开展了燃耗数据库的基准检验方法研究，并将所建立的方法体系应用于 FRBurn.lib 的验证。最后，以日本 JOYO 快堆 MK-1 组件为基准题对 FRBurn.lib 进行验证，计算值与实验值符合良好，验证了该数据库的准确性与可靠性。

关键词

燃耗数据库；燃耗基准检验；积存量计算；JOYO；CINDER90

Abstract

To develop a high-accuracy burnup database for fast reactors and establish a refined and systematic benchmark validation method, this study developed the LIB_Convert code. Combined with the general burnup database production system GENDEPLIX, a burnup database FRBurn.lib suitable for the CINDER90 code was produced based on the CNAF 3.4 and ENDF/B-VIII.0 libraries. Then, taking the TAKAHAMA-3 pressurized water reactor as the object, systematic research on the benchmark validation method for the burnup database was carried out, and the established methodology was applied to the verification of FRBurn.lib. Finally, the FRBurn.lib database was validated using the Japanese JOYO fast reactor MK-1 assembly as a benchmark problem. The calculated values are in good agreement with the experimental values, verifying the accuracy and reliability of the database.

Keywords

Burnup database; Burnup benchmark validation; Inventory calculation; JOYO; CINDER90

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Session Classification: 海报展示

Track Classification: 海报展示: 海报展示