原子能科学技术 2010 44 (11): 1322-1327 ISSN: 1000-6931 CN: 11-2044/TL

反应堆工程

确定反应堆核功率刻度中修正系数的新方法

邓勇军;李润东;刘永康;周韦

中国工程物理研究院 核物理与化学研究所，四川 绵阳621900

收稿日期 修回日期 网络版发布日期:

摘要 基于Westcott理论刻度反应堆核功率是目前应用最为广泛的方法，但该方法需要用到大量的修正参数，而修正参数在很大程度上依赖于基于某些特定堆型的经验公式，非常繁琐。本工作利用MCNP程序对堆芯乃至堆芯内活化箔的布置情况进行精确描述，通过理论计算直接得到活化箔活性与反应堆核功率之间的关联系数，从而直接用实验测得的堆芯中子注量分布及归一点的活化箔活性导出反应堆的功率。该方法具有简单、准确度高、适用范围广等特点。本工作以300＃反应堆为例，将理论计算结果与实验测量结果进行了比较，验证了该方法的可行性。

关键词 中子注量 修正系数 功率 MCNP程序

分类号

New Method in Obtaining Correction Factor of Power Confirming

DENG Yong-jun;LI Run-dong;LIU Yong-kang;ZHOU Wei

China Academy of Engineering Physics, P. O. Box 919-227, Mianyang 621900, China

Abstract Westcott theory is the most widely used method in reactor power calibration, which particularly suited to research reactor. But this method is very fussy because lots of correction parameters which rely on empirical formula to special reactor type are needed. The incidence coefficient between foil activity and reactor power was obtained by Monte-Carlo calculation, which was carried out with precise description of the reactor core and the foil arrangement position by MCNP input card. So the reactor power was determined by the core neutron fluence profile and the foil activity placed in the position for normalization use. The characteristic of this new method is simpler, more flexible and accurate than Westcott theory. In this paper, the results of SPRR-300 obtained by the new method in theory were compared with the experimental results, which verified the possibility of this new method.

Key words neutron fluence correction coefficient power MCNP code

DOI

通讯作者