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核动力堆安全壳内外中子能谱和剂量测量

@陈军\$中国原子能科学研究院放射性计量测试部!北京102413

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摘要 利用自制的多球谱仪测量了某核动力反应堆安全壳内外的中子能谱和剂量当量率。对安全壳外测量,中心探测器为球形 ^3He 正比计数管;对安全壳内测量,中心探测器为球形金箔。系统的响应函数用MCNP程序计算,解谱程序为MIEKEB。为验证系统响应函数计算的准确性,进行了一些实验测量,并与理论计算结果进行了比较。结果表明,测量结果与计算结果在不确定度范围内相吻合。

关键词 [多球谱仪](#) [球形 \$^3\text{He}\$ 正比计数管](#) [球形金箔](#) [中子能谱](#) [中子剂量当量率](#)

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Measurements of Neutron Spectra and Doses Inside and Outside the Containment of a Power Reactor

CHEN Jun (China Institute of Atomic Energy, P. O.Box 275-20, Beijing 102413, China)

Abstract The neutron spectra and the neutron dose equivalent rates inside and outside the containment of a power reactor were measured with two multi-sphere spectrometer systems that the central detectors are a spherical gold foil and a spherical ^3He proportional counter, respectively. The response functions were calculated by MCNP code, and MIEKEB code was used for unfolding. Some experiments were done in order to verify the accuracy of the calculated response functions of these systems. The measured results were compared with the calculated results. It is shown that they are accordant in their uncertainties.

Key words [multi-sphere spectrometer](#) [spherical \$^3\text{He}\$ proportional counter](#) [spherical gold foil](#) [neutron spectrum](#) [neutron dose equivalent rate](#)

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