物理

# 使用活化探测器和成像盘技术相结合的方法测量混凝土屏蔽体内中子空间分布

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摘要　　描述了一种联合使用活化探测器和成像盘技术（IP）探测中子注量的方法。利用这种方法测量了高能中子束线装置KENS（KEK spallation neutron source facility）中混凝土屏蔽体内中子的空间分布。高能中子注量衰减的实验结果与使用蒙特卡罗程序MARS14模拟计算的结果符合很好。结果表明，联合使用活化探测器和成像盘技术可以同时测量多个位置的中子注量，直观展现出混凝土屏蔽体内中子强度的分布情况。

关键词　　活化探测器　成像盘技术　中子 _ 屏蔽混凝土　空间分布
分类号　TL816.3

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# Measurement of Neutron Spatial Distribution Inside of a Concrete Shield Using Activation Foil and Imaging Plate Technique

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## Abstract

The spatial distribution of neutrons inside the concrete shield of KENS were measured by the combined use of activation detectors and an imaging plate. Aluminium and gold foils were used for neutron flux measurements of both high- energy and thermal neutrons, respectively. The obtained results concerning attenuation of the high-energy neutron flux show a good agreement with results obtained by a Monte-Carlo simulation using the MARS14 code. It is concluded that the method, which combined the use of activation detectors and an imaging plate, was very useful to measure the activity of many pieces of the detector simultaneously without any efficiency or decay correction. A wide dynamic range and a high sensitivity are also merits of this method.

**Key words** activation detector _ imaging plate _ neutron _ shielding concrete _ spatial distribution

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