

物理

主动法中子时间关联符合测量探测金属铀质量和丰度

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摘要 主动法中子时间关联符合测量是金属铀核查认证技术的重要手段之一。本文通过数值模拟分析了窄束²⁵²Cf中子源诱发不同质量、不同丰度的金属铀材料的中子输运过程, 并获得了其时间关联符合计数。通过分析时间关联符合计数特征参数, 验证了时间关联符合计数的FWTH与增殖系数、FWTH内的总计数与增殖系数和²³⁵U质量的乘积及外中子源衰减与金属铀总质量的正比关系, 由此建立了金属铀质量和丰度的主动中子时间关联符合测量探测方法。

关键词 [时间关联](#) [金属铀](#) [质量](#) [丰度](#)

分类号

Active Method of Neutron Time Correlation Coincidence Measurement to Authenticate Mass and Enrichment of Uranium Metal

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Abstract The active methodology of time correlation coincidence measurement of neutron is an effective verification means to authenticate uranium metal. A collimated ²⁵²Cf neutron source was used to investigate mass and enrichment of uranium metal through the neutron transport simulation for different enrichments and different masses of uranium metal, then time correlation coincidence counts of them were obtained. By analyzing the characteristic of time correlation coincidence counts, the monotone relationships were founded between FWTH of time correlation coincidence and multiplication factor, between the total coincidence counts in FWTH for time correlation coincidence and mass of ²³⁵U multiplied by multiplication factor, and between the ratio of neutron source penetration and mass of uranium metal. Thus the methodology to authenticate mass and enrichment of uranium metal was established with time correlation coincidence by active neutron investigation.

Key words [time](#) [correlation](#) [uranium](#) [metal](#) [mass](#) [enrichment](#)

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