

技术及应用

掺钆高阻性板室热中子探测器的性能模拟

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摘要 利用MCNP和Garfield程序模拟粒子与高阻性板室(RPC)热中子探测器的作用过程, 计算出了转换体 Gd_2O_3 的最佳厚度和高阻性板室探测器对中子、 γ 的灵敏度, 并得出了热中子和1.25 MeV γ 与探测器作用产生的电子能谱。最终利用模拟数据给出了RPC热中子探测器的探测效率和时间分辨随电场、混合气体比例的变化规律, 得到了最佳的电场强度和混合气体比例。

关键词 [热中子探测器](#) [灵敏度](#) [能谱](#) [探测效率](#) [时间分辨](#)

分类号

Properties Simulation of Gd-Coated Resistive Plate Chambers Thermal Neutron Detector

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Abstract The sensitivities to γ ray and neutron were simulated by MCNP and Garfield programs for the Gd coated resistive plate chambers thermal neutron detector. The electron energy spectra produced by the detector interacting with the thermal neutron and 1.25 MeV γ ray were also given. At last, the relationship between the time resolution and the detection efficiency with the electric field and the proportion of the mixture gas were calculated. By using the simulation data, the optimal electric field and the proportion of the mixture were presented.

Key words [thermal neutron detector](#) [sensitivity](#) [energy spectrum](#) [detection efficiency](#) [time resolution](#)

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