

Design of a High Efficiency Neutron Detector Using a GEM

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Abstract

The radiation detector research group at KAERI has developed a high efficiency neutron detector using a Gas Electron Multiplier (GEM). The double GEM was fabricated and operated in an Ar/Isobutane mixture. For an application to a high efficiency neutron detector, ${}^6\text{Li}$ or ${}^{10}\text{B}$ neutron converters coated on each surface of the multi GEM foils were considered. The optimized thickness of the thin film for a neutron detection was calculated with the MCNP and SRIM. The neutron efficiency was calculated by changing the chemical components of the thin film, and the thickness of the thin film. The thermalized neutrons were measured by a GEM detector with a thin neutron converter on the drift plate.