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R&D of neutron beam monitor based GEM detector

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A thermal neutron beam monitor with Gas Electron Multiplier (GEM) as a detector is developed to meet the needs of the next generation neutron facilities. A prototype chamber has been constructed with two 50mm x 50mm GEM foils. Enriched boron-10 is coated on one surface of aluminum cathode plate as the neutron convertor. 96 channel pads with area 4 mm x 4mm each are used for fast signal readout. In order to study the basic characteristics of boron-coated GEM detector, several irradiation tests were carried out with α source ^{239}Pu and neutron source $^{241}\text{Am}(\text{Be})$. The signal induced by neutron has high signal-to-noise ratio. A clear image obtained from α source ^{239}Pu is presented, which shows that the GEM-based detector has good two-dimensional imaging ability.

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