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Development of a fast simulator for GEM-based neutron detectors

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Gas Electron Multiplier (GEM)-based detectors using a layer of ^{10}B as a neutron converter is becoming popular for thermal neutron detection. A common strategy to simulate this kind of detector is based on two frameworks: Geant4 and Garfield++. The first one provides the simulation of the nuclear interaction between neutrons and the ^{10}B layer, while the last allows the simulation of the interaction of the reaction products with the detector gas leading to the ionization and excitation of the gas molecules. Given the high ionizing power of this nuclear reaction products, a full simulation is very time consuming and must be optimized to become viable. In this work, we present a strategy to develop a fast simulator based on these two frameworks that will allow to generate enough data for a proper evaluation of the expected performance and optimization of this kind of detector. We will show the first results obtained with this tool concentrating on its validation and performance.

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