GEMC: a database driven Monte Carlo simulation program

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Abstract

The parameters needed to simulate the detectors response to physics interactions are stored in a database. This includes geometry, materials, magnetic field, electronics.

GEMC includes a python API to generate and store the databases, and the software to run the Monte-Carlo simulation. The engine is written in C++ and uses Geant4 for the passage of particles through matter.

An overview of the software, and its usage will be presented in this talk Examples will be shown on how to build geometry, handle geometry variations, and provide realistic electronic response. The usage of GEMC at Jefferson Lab in the CLAS12 experimental program will be shown.