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The Geant4-based simulation program for the PandaX experiments

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PandaX is an experiment that aims to search for dark matter, neutrinoless double beta decay, and other rare processes using a liquid xenon time projection chamber. A good understanding of the energy deposition processes in the detector holds great importance to the experiment. To address this, BambooMC, a Geant4-based Monte Carlo simulation program, has been developed. In this presentation, the design and functionalities of BambooMC will be introduced, along with an innovative simulation acceleration scheme where a biasing technique is employed. The sensitive region of the detector is simulated in a layered fashion, with an amplified number of events in each layer. With this technique, the simulation speed is enhanced by approximately three orders of magnitude.

Author: LI, Tao (Sun Yat-sen University)

Presenter: LI, Tao (Sun Yat-sen University)

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