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The basic model of crystalline medium simulation in GEANT4

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In this work we propose a relatively simple model for taking into account the medium crystallinity in GEANT4. The model includes a simplified method for crystallinity description by changing cross-sections of the physical processes without microscopic motion simulation of the charged particles in channeling mode. The cross-sections for processes of Bremsstrahlung and the electron-positron pair production in GEANT4 are modified depending on the particles energy according to the coefficients obtained from the simulation of the channeling process using a microscopic model for various crystalline axes or planes and materials.

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