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First ab-initio channeling and Baier-Katkov Geant4 FastSim model

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The design of innovative applications of electromagnetic interactions of charged particles interactions with oriented crystals in accelerator physics, detector physics, astrophysics, nuclear physics and radiation therapy requires extensive and reliable simulation tool to simulate in details all the experimental setup. Therefore, the implementation of the physics of channeling and radiation in oriented crystals into Geant4 simulation toolkit is in high demand.

In this work we present the first ab-initio Geant4 ChannelingFastSimModel including simulations of charged particles trajectories in a crystalline averaged atomic potential as well as their radiation spectra and secondary photons production using the Baier-Katkov method.

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