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Geant4 simulations of radio signals from particle showers for the SLAC T-510 experiment

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The SLAC T-510 experiment was designed to reproduce the physics of radio emission from air showers in a controlled lab experiment with the goal to test established formalisms for simulation of radio emission physics: the “end-point” formalism and the “ZHS” formalism.

Simulation results derived with these formalisms can be explained by a superposition of magnetically induced transverse current radiation and the Askaryan (charge-excess) effect.

Here, we present results of Geant4 simulations of the experiment with both formalisms, taking into account the details of the experimental setup (beam energy, target geometry and material, magnetic field configuration and refraction effects) to test this hypothesis.

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