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SLAC T-510: A beam-line experiment of radio emission from particle cascades in the presence of a magnetic field

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Radio detection is a technique of great interest for detecting ultra-high energy cosmic rays. Models of radio emission from extensive air showers, based solely on principles of classical electrodynamics, were developed in recent years. The SLAC T-510 experiment was conducted in January-February of 2014 using an electron beam to validate these models in a laboratory environment. Secondary cascades were induced by a 4.35 GeV electron beam in a polyethylene target in presence of a controlled magnetic field of up to 1000 G to mimic the geomagnetic field. The radio emission was measured in both vertical and horizontal linear polarizations by UHF and VHF antennas at different locations relative to the cascade. The experimental results, are in very good agreement with the models. The results and the models are described in details in separate contributions to this conference. The emission associated with the Askaryan component as well as the emission associated with the magnetic field were observed. A brief description of the experiment as well as the main results will be discussed.

Collaboration

– not specified –

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