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Geomagnetic and Askaryan Contributions to the Radio Emission from Cosmic-Ray Air Showers at the South Pole EK NARAYAN PAUDEL, Department of Physics and Astronomy, University of Delaware, FRANK SCHROEDER, Department of Physics and Astronomy / Bartol Research Institute, University of Delaware, ICECUBE COLLABORATION — Ultra-high energy cosmic rays are emitted by yet unknown extreme astrophysical sources in the Universe. Due to their very low flux, such cosmic rays can only be studied indirectly using extensive air showers generated by them in the Earths atmosphere. Among several techniques, radio antennas can measure the radio emission from these showers which can be utilized for the reconstruction of the mass, energy, and arrival direction of the cosmic rays. Geomagnetic emission is the dominant mechanism of radio emission from air showers. It occurs due to a time-dependent transverse current in the shower front which is caused by the charge separation of air shower particles in the Earths magnetic field. Geomagnetic emission is linearly polarized along the direction of the geomagnetic Lorentz force. The less dominant Askaryan emission occurs due to time-dependent negative charge excess developed at the shower front and is radially polarized. CORSIKA/CoREAS air-shower simulations were used to simulate the radio emission from air showers at the location of the South Pole. In this talk, we are presenting our study on the relative fraction of the Askaryan contribution in the radio emission of these air showers and its dependence on parameters such as the arrival direction.

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