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Using GEANT4 to model the photonic component of cosmic ray air showers. J. BENCH, S. NUTTER, Northern Kentucky University — The CREST (Cosmic Ray Electron Synchrotron Telescope) project uses a high altitude balloon to carry a cosmic ray detector into Earth's upper atmosphere. The purpose of the project is to understand more about the local galactic sources that produce high-energy electron cosmic rays by detecting the linear pattern of synchrotron radiation emitted as the electrons are diverted by Earth's magnetic field. While this pattern is very distinct, there is a possibility that a similar pattern could be mimicked by cosmic ray air showers, which also produce temporally and spatially correlated photons. To estimate the background event rate due to air showers at balloon altitudes, GEANT4 is used to simulate cosmic ray air showers. The simulation entails modeling the composition and structure of earth's atmosphere by representing it as hundreds of variable density layers, along with reproducing the cosmic ray incident energy spectrum and composition. Information about photons is recorded as they pass through different depths in the atmosphere.

S. Nutter
Northern Kentucky University

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