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Synchrotron radiation from primary cosmic ray electrons: Monte Carlo studies of event topographies and potential backgrounds at balloon altitudes

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Abstract content

The balloon-borne Cosmic Ray Electron Synchrotron Telescope (CREST) experiment will measure the flux of cosmic ray electrons at energies greater than 2 TeV by detecting the x-ray component of the synchrotron radiation emitted as the electrons traverse the Earth's magnetic field. This method enhances the instrument acceptance to several times its geometric area. A Monte Carlo simulation of electrons traversing the atmosphere was performed using GEANT4 in order to calculate the acceptance of CREST, characterize synchrotron radiation patterns at balloon altitudes, and search for potential backgrounds due to clusters of x-ray photons within atmospheric showers. The study results influence the design of CREST and potential future instruments using a similar detection technique.

If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olivo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 2 (OG part 1), pages 309-312

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