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Energy spectrum and arrival directions of high-energy electrons over 100GeV observed with PPB-BETS

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Abstract content

We have observed cosmic-ray electrons from 10GeV to 1TeV with PPB-BETS by a long duration balloon flight using Polar Patrol Balloon (PPB) in Antarctica. The observation was carried out for 13 days at an altitude of 35 km in January 2004. The detector is an imaging calorimeter composed of scintillating-fiber belts and plastic scintillators inserted between lead plates. The geometrical factor of detector is about $600 \text{ cm}^2 \text{sr}$ and the total thickness of lead absorber is 9 radiation lengths. We have collected 5.7×10^3 events over 100GeV including nearly 100 candidates of primary electrons. During the flight, sun sensors and geomagnetic aspect meters were operated to determine the attitude of the instrument. The arrival directions of high-energy electrons over 100GeV, together with the energy spectrum, are suggested to be a powerful probe to identify nearby cosmic-ray electron sources. In this paper, we present the energy spectrum and arrival directions of cosmic-ray electrons from 100GeV to 1TeV observed with PPB-BETS, and discuss the anisotropy of the high-energy electrons.

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 59-62

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