

Observations of solar particle events with the PAMELA mission

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The PAMELA satellite experiment, in low Earth orbit since June 2006, is providing comprehensive observations of the Solar Energetic Particle (SEP) events between solar cycles 23 and 24. Its unique capabilities include the possibility of accurately measuring the SEP energetic spectra in a large interval (>80 MeV), encompassing the low energy data by other space-based instruments and the Ground Level Enhancement (GLE) data by the worldwide network of neutron monitors. Furthermore, PAMELA is able to measure the flux angular distribution and thus investigate possible anisotropies. The analysis is supported by back-tracing techniques based on a realistic modeling of the terrestrial magnetosphere, which enables to reconstruct the asymptotic pitch-angle distribution of SEPs with respect to the local interplanetary magnetic field. PAMELA results significantly enhance the characterization of SEP fluxes in the near-Earth space, constraining the scenarios for particle acceleration and transport mechanisms.

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