

Study of cosmic-ray spectrum using gamma-ray data from Fermi Large Area Telescope

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Cosmic rays (CRs) are high energy particles in space, mainly protons, for which the spectrum is well described by a power law. Recent measurements from PAMELA and AMS-02 indicate an abrupt change of the CR proton spectral index at ~ 300 GeV. When CRs interact with the Earth's upper atmosphere, gamma-ray (γ -ray) photons can be produced and detected by space-based detectors. We use the Earth's γ -ray data observed by the *Fermi* Large Area Telescope (*Fermi*-LAT) along with proton-air interaction model perform Monte Carlo simulation and determine the CR proton spectral indices that best fit the γ -ray data.

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