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Fermi-LAT Measurement of Cosmic-ray Proton Spectrum

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The Pass 8 gamma-ray simulation and reconstruction package for the Large Area Telescope (LAT) on the Fermi Gamma-ray Space Telescope
has dramatically enhanced the ability of the LAT to perform gamma-ray science. The Pass 8 improvements have also allowed for the development
of a new cosmic-ray proton analysis. Using the new Pass 8 direction and energy reconstruction, we create a new proton event selection.
This event selection has an acceptance of 1 m^2 sr over the incident proton energy range from 20 GeV to over 1 TeV. This event selection applied
to over 6 years of LAT observations provides high statistics for a spectral measurement. The systematic errors in the acceptance and energy
reconstruction require careful study. The event selection and spectral measurement of the Pass 8 proton analysis opens the door to additional
proton analyses with the LAT, such as the evaluation of proton anisotropy. We present a detailed study of the measurement of the cosmic-ray
proton spectrum with Pass 8 data for the Fermi-LAT.

Collaboration

FERMI

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