PROCEEDINGS OF SCIENCE

An all-sky search for cosmic-ray proton anisotropy with the Fermi Large Area Telescope

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Multiple ground-based detectors have measured cosmic-ray anisotropy at the TeV and PeV energy scales. These detectors are only sensitive to the variation of cosmic-ray flux in right ascension, not to the declination component of the anisotropy. As a space-based, all-sky survey instrument, the Fermi Large Area Telescope detects cosmic rays from the entire sky and is sensitive to arbitrary orientations of cosmic-ray anisotropy. Moreover, the LAT has good ability to discriminate protons from helium nuclei and heavier ions, while ground-based detectors have limited composition resolution. The LAT is also complementary in energy range and, thanks to its large acceptance, has detected the largest number of primary cosmic-ray protons at the 100 GeV energy scale of any detector. We present the results of an all-sky search for cosmic-ray proton anisotropy using 200 million protons detected over eight years. The analysis is sensitive to possible dipole signals with arbitrary orientation and amplitude at the 10^{-3} scale.

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We refer readers to the full paper describing results of this analysis [1].

References

[1] The Fermi-LAT Collaboration, *arXiv e-prints* (Mar, 2019) arXiv:1903.02905.