Indirect measurement of cosmic-ray proton spectrum using γ-ray data from *Fermi* Large Area Telescope

Patomporn Payoungkhamdee[†]
under supervision of
Asst. Prof. Warit Mitthumsiri[†], Prof. David John Ruffolo[†]
[†]Mahidol University

Abstract

Cosmic rays (CRs) are high-energy particles propagating in space. It is mainly constituted by protons and the rigidity spectrum is well described by a power law. Recent measurements by PAMELA and AMS-02 indicate an abrupt change of the CR proton spectral index at about 336 GV. When protons interact with the Earths upper atmosphere, γ-rays can be produced and detected by space-based detectors. The Earth Limb γ-ray data was collected by the *Fermi* Large Area Telescope (LAT) along with proton-air interaction models to determine the CR proton spectral indices that best fit the γ-ray data.

Keywords— Cosmic rays, gamma-rays, *Fermi*-LAT

References

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