

Gamma Rays from Cosmic Ray Collisions with the Sun Observed with Fermi

Monday, 4 May 2015 16:10 (20 minutes)

The Sun is a bright gamma ray source due to interactions between cosmic rays and the solar atmosphere. These gamma rays were detected from 0.1 to 10 GeV by Fermi with 18 months of data, and were found to be in disagreement with theoretical predictions. In this work we update the measurement using 6 years of Fermi data. The improved statistics allow us to detect the gamma rays up to 100 GeV and discover new features in the gamma ray spectrum. This provides a solid basis for revisiting the theoretical modeling of cosmic ray interactions with the Sun. Thorough understanding of the hadronic gamma ray production process helps predicting the corresponding neutrino flux, which may allow the Sun to be detectable by IceCube.

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Session Classification: Gamma Rays

Track Classification: High-Energy Gamma-Ray Astrophysics