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The intensity and origin of the isotropic gamma-ray background

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The data collected by the Fermi Large Area Telescope (LAT) enable a huge step forward in measuring and understanding the origins of the isotropic gamma-ray background (IGRB). The IGRB originates from the superposition of different populations of unresolved sources with possible contributions from genuinely diffuse and exotic processes. In most parts of the sky it is sub-dominant to the Galactic diffuse emission, which represents a foreground to be subtracted to allow a measurement of the IGRB intensity. In the most recent study we use 50 months of LAT data to extend the measurement of the spectrum of the IGRB to the energy range between 100 MeV and 820 GeV. Furthermore, this study is based on an improved event selection, a better understanding of the Galactic diffuse emission, the solar system foregrounds, and charged particle backgrounds, when compared to the results published in Abdo et al., 2010. We discuss the possible presence of a high-energy cutoff (>100 GeV) in the IGRB spectrum and its implications, and how systematic uncertainties from the foreground modeling impact the shape and normalization of the measured spectrum.

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