

Fermi-LAT observations of the Sagittarius B complex

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We use 5 years of *Fermi*-LAT data towards the Galactic-centre giant molecular cloud complex, Sagittarius B, to test questions of how well-mixed the Galactic component of cosmic rays are and what the level of the cosmic-ray sea in different parts of the Galaxy is. We use dust-opacity maps from the *Planck* satellite to obtain independent methods for background subtraction and an estimate for the mass of the region. We then present high-quality spectra of γ -ray emission from 0.3 to 30 GeV and obtain an estimate of the cosmic-ray spectrum from the region. We obtain an estimate of the mass of the region of $1.5 \pm 0.2 \times 10^7$ using the *Planck* data, which agrees well with molecular-line-derived estimates for the same region. We find the γ -ray flux from this region is fitted well with a cosmic-ray spectrum that is the same as is observed locally, with evidence of a small over-density at intermediate (1–10 GeV) energies. We conclude that the γ -ray and cosmic-ray spectrum in the region can be well-fitted using a local cosmic-ray spectrum.

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