

Abstract Submitted
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Diffuse gamma-ray emission modeling near the Galactic Center and the 3 GeV excess ANDREA ALBERT, Los Alamos National Lab, DMITRY MALESHEV, University of Erlangen-Nuremberg, ANNA FRANCKOWIAK, DESY Zeuthen, LUIGI TIBALDO, Max Planck Institute Heidelberg, FERMI-LAT COLLABORATION — Several groups have reported excess emission in gamma rays peaking around 3 GeV relative to expectations from conventional models for the interstellar emission in the Galactic Center (GC). We study the uncertainty of the excess emission in Pass 8 Fermi-LAT data due to modeling of the various emission components in that direction. In particular, we quantify the uncertainties on the excess by refitting with several GALPROP models of Galactic diffuse emission, an alternative distribution of gas along the line of sight based on starlight extinction data, a model of the Fermi bubbles at low latitudes, and including templates for additional sources of cosmic-ray electrons near the GC. In all models that we have tested the excess emission remains significant. The origin of the excess is currently uncertain. To test the robustness of a dark-matter interpretation, we perform fits in controls regions along the Galactic Plane. The uncertainties from our fits in control regions have a similar relative size as the excess in the GC. Therefore a non-dark-matter explanation cannot be ruled out and we consequently set limits on the dark matter annihilation cross section.

Andrea Albert
Los Alamos National Lab

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