

An Apparent Anomalous Diffuse gamma-ray emission feature, and its Possible Association with the the worm GW18.5+2.8

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We present results of an analysis of EGRET data which indicate the presence of a possible anomalous diffuse emission feature. The analysis method nonparametrically estimates statistically significant residuals in a Poisson dataset relative to a given null hypothesis. Here, our null hypothesis consisted of a model for Galactic diffuse gamma-ray emission, the estimated isotropic gamma-ray background, a symmetric halo component, and the point sources from the Lamb and Macomb GeV EGRET source catalog. The resultant residual shows an apparently diffuse feature emanating northward from the Galactic plane in the region $l \sim 15^\circ - 21^\circ$. Examination of COMPTEL skymaps indicate a very bright but unidentified MeV source which coincides with the footpoint of the GeV feature. Further, the location and longitudinal extent of this feature is highly coincident with that of the “worm” GW 18.5+2.8 (Heiles, Reach, and Koo 1996, ApJ, 466, 191), a large radio feature which includes the Stockert Chimney. A powerful HII region, M16, lies at the base of GW 18.5+2.8. We discuss the possibility that cosmic-rays from massive stellar processes may be responsible for the gamma-ray emission.