

Abstract Submitted
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Searches for Angular Extension in High Latitude Fermi-LAT Sources REGINA CAPUTO, Univ of California-Santa Cruz, MATTIA DI MAURO, SLAC, MANUEL MEYER, Stockholm University, BRENDAN WELLS, Univ of California-Santa Cruz, MATTHEW WOOD, SLAC, FERMI-LAT COLLABORATION — We present a comprehensive search for angular extension in high-latitude gamma-ray sources detected by the Fermi Large Area Telescope (LAT) using the 4-year LAT Point Source Catalog (3FGL). The majority of high-latitude LAT sources are extragalactic blazars that appear point-like within the LAT angular resolution. However, there are physics scenarios that predict populations of spatially extended sources. In one scenario, electron-positron pair cascades from gamma rays produced in blazars are deflected in the Intergalactic Magnetic Field (IGMF) producing extended emission, or "pair halos". The detection of a pair halo component around a LAT-detected blazar would provide a measurement of the strength and coherence length scale of the IGMF. In another scenario, the annihilation or decay of Weakly Interacting Massive Particles, a candidate for dark matter (DM), in Milky Way subhalos would appear as a population of unassociated gamma-ray sources with an angular extension. The detection of spatial extension in nearby sub halos could provide compelling evidence for a DM interpretation and would serve as an independent cross-check against other DM searches. We report on the angular extension catalog based on 7.5 years of Pass 8 data and discuss the implications of these results.

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