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Unassociated Gamma-ray Sources as Targets for Indirect DM Detection with Fermi-LAT

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We perform a search of Dark Matter (DM) subhalo candidates among unassociated catalogued sources present in the most recent Fermi-LAT point-source catalogs (3FGL, 2FHL and 3FHL). These LCDM-predicted DM subhalos are promising candidates for gamma-ray emission from WIMP annihilation in the LAT energy band. Several selection criteria are applied, based on the expected properties of the DM-induced emission from DM subhalos, which allow us to significantly reduce the list of potential candidates. Then, by characterizing the LAT sensitivity to DM subhalos and by comparing our remaining candidates' list to state-of-the-art predictions based on the Via Lactea II N-body cosmological simulation, we place conservative and robust constraints on the annihilation cross section as a function of DM particle mass. These complementary constraints are comparable to those obtained from LAT observations of dwarf galaxies.

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