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Searches for Dark Matter Annihilation in Dwarf Spheroidal Galaxies with the Fermi LAT

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The dwarf spheroidal satellite galaxies of the Milky Way are some of the most dark-matter-dominated objects observed. Their proximity, high dark matter content, and lack of astrophysical backgrounds make them one of the most promising targets for the indirect detection of dark matter via gamma rays. Here we report on gamma-ray observations of 25 Milky Way dwarf spheroidal satellite galaxies based on 4 years of Fermi Large Area Telescope (LAT) data. None of the galaxies are significantly detected in gamma rays. We utilize stellar kinematic data for a subset of 15 dwarf galaxies to place robust constraints on the thermally-averaged dark matter annihilation cross section in the dark matter mass range from 2 GeV to 10 TeV.

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