Abstract Submitted
for the APR17 Meeting of
The American Physical Society

Estimating the GeV Emission of Millisecond Pulsars in Dwarf Spheroidal Galaxies MILES WINTER, Univ of Wisconsin, Madison, GABRIJELA ZAHARIJAS, Istituto Nazionale di Fisica Nucleare - Sezione Trieste, KEITH BECHTOL, JUSTIN VANDENBROUCKE, Univ of Wisconsin, Madison — Dwarf spheroidal satellite galaxies (dSphs) are among the most dark matter dominated systems in the cosmos, which, complemented by a favorable proximity to the Milky Way, makes them extremely important targets in the ongoing search for indirect dark matter detection via gamma rays. While the conventional astrophysical background in dSphs has long been assumed to be negligible, Fermi LAT measurements of a population of luminous gamma-ray emitting galactic millisecond pulsars (MSPs) potentially challenge this assumption. With that in mind, we present an estimate of the conventional astrophysical emission intrinsic to 30 dSphs of the Milky Way, focusing on MSPs, and evaluate the potential for confusion with dark matter annihilation signatures at GeV energies. We predict that MSPs in the highest stellar mass dSphs, Fornax and Sculptor, produce a gamma-ray flux that is approximately a factor of 10 below the current LAT sensitivity. However, for ultra-faint dSphs, typically the most dark matter dominated, we estimate the MSP emission to be several orders of magnitude below both the LAT sensitivity and the flux expected from dark matter annihilation, suggesting that these targets will remain safe for indirect dark matter searches in the foreseeable future.

Miles Winter
Univ of Wisconsin, Madison

Date submitted: 30 Sep 2016 Electronic form version 1.4