

Indirect Dark Matter Searches with Fermi-LAT

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With over 14 years of data collection, many dark matter (DM) searches have been performed with Fermi-LAT. Notably, a systematic excess of gamma rays has been detected coming from the Galactic Center (GC) region, and the current leading explanations include mis-modeling of the Galactic diffuse emission along the line of sight, emission from a sub-threshold source population such as millisecond pulsars, and/or WIMP DM annihilation. However, no complementary signal has yet been detected from a combined analysis of the Milky Way dwarf spheroidal satellite galaxies, and numerous studies have placed upper limits on the DM annihilation cross section. These upper limits remain one of the most robust and stringent constraints from indirect DM searches and, specifically, they are crucial for DM interpretations of the GC excess. Other complementary studies have provided competitive and independent upper limits as well, including those obtained from dwarf irregular galaxies, the Large and Small Magellanic Clouds, Galactic DM subhalos, the Milky Way halo, M31, galaxy clusters, the extragalactic gamma-ray background, and DM signals towards the Sun. Limits have also been placed on models of axion-like particles (ALPs), in this case looking for ALP-induced spectral distortions in LAT data. In this talk I will give a broad overview of these past results and also discuss future prospects for indirect DM searches with the LAT.

Track

Dark Matter

Primary author: KARWIN, Christopher Michael

Presenter: KARWIN, Christopher Michael

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