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Search of dark matter annihilation in stellar streams with the Fermi LAT

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Stellar streams whose progenitor is a dwarf galaxy (dG) are particularly interesting targets for dark matter (DM) searches, since dGs are thought to be highly DM-dominated systems. We expect these streams to have lost most of their DM content during the stretching process, yet a significant amount of DM should remain within their core. If the DM particles are Weakly Interacting Massive Particles (WIMPs), they could annihilate in the streams'core, producing a detectable gamma-ray signal. We analyze data from the Large Area Telescope on board the NASA Fermi satellite (Fermi LAT) to look for a potential WIMP annihilation signal from the direction of an optimized sample of streams. In the absence of a signal, we place the first constraints on the WIMP parameter space obtained from these objects for several annihilation channels.

In this talk, we summarize our current research on stellar streams as a novelty and complementary target for DM searches with gamma rays. A combined likelihood analysis of individual streams in our sample allows us to set constraints that are highly competitive to those obtained via other experiments and targets, shown the potentiality of these sources as possible probes of indirect DM detection.

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