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Indirect Searches for Secluded Dark Matter

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Dark matter remains one of the most important open problems in particle physics and cosmology. Weakly interacting massive particles (WIMPs) appear as an appealing solution, providing the right relic density with a cross-section at the electroweak scale, however, no WIMP signals were observed until now. Secluded models are good alternatives to the standard ones. In this case, instead of a direct annihilation into the standard model (SM) particles, the dark matter annihilates into mediators which subsequently decay into SM particles. In this way, we can avoid the stringent limits from direct searches, and, at the same time, secluded models can be probed by indirect detection experiments. Motivated by the appearance of secluded dark matter in several model building endeavors, in this talk, we will present the sensitivity of several gamma-ray instruments (current and prospects), including Fermi-LAT, H.E.S.S., CTA, and SWGO, to secluded dark matter annihilations in the inner galactic halo, and in the dwarf spheroidal galaxies, covering a wide range of possible DM masses, from tens of GeV to hundreds of TeV.

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