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Indirect Detection of Secluded Supersymmetric Dark Matter

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Weak-scale secluded sector dark matter can reproduce the observed dark matter relic density with thermal freeze-out within that sector. If nature is supersymmetric, three portals to the visible sector - a gauge portal, a Higgs portal, and a gaugino portal - are present. We present gamma ray spectra relevant for indirect detection of dark matter annihilation in such setups. Since symmetries in the secluded sector can stabilize dark matter, R-parity is unnecessary, and we investigate the impact of R-parity violation on annihilation spectra. We present limits from the Fermi Large Area Telescope observations of dwarf galaxies and projections for Cherenkov Telescope Array observations of the galactic center. Many of our results are also applicable to generic, non-supersymmetric setups.

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