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A search for dark matter subhalo candidates in the gamma-ray band

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We present a search for potential dark matter subhalos in our Galaxy exploiting the high (100 MeV - 100 GeV) and very high energy (>100 GeV) gamma-ray band. We assume the dark matter to be formed of annihilating weakly interacting massive particles of mass over 100 GeV. In such a scenario, most of the photons from the dark matter annihilation spectrum are expected in the high energy gamma-ray band, whereas a distinctive spectral cut-off located at the dark matter particle mass is expected in the very high energy gamma-ray band. We present a thorough selection of high energy gamma-ray sources as dark matter subhalo candidates out of the Fermi-Large Area Telescope Second Source Catalog. We compute the detection prospects of such sources in the very high energy gamma-ray band by the current and future generation of imaging atmospheric Cherenkov telescopes after assuming their gamma-ray emission to be originated by dark matter annihilation. A list of the best dark matter subhalo candidates to be observed by such telescopes is proposed.

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