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Blazar-Boosted Dark Matter

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Relativistic protons and electrons in the extremely powerful jets of blazars may boost via elastic collisions the dark matter particles in the surroundings of the source to high energies. The blazar-boosted dark matter flux at Earth may be sizeable, larger than the flux associated with the analogous process of DM boosted by galactic cosmic rays, and relevant to access direct detection for dark matter particle masses lighter than 1 GeV both with target nuclei and/or electrons. From the null detection of a signal by XENON1T, MiniBooNE, and Borexino with nuclei (by Super-K with electrons) we have derived limits on dark matter-nucleus spin-independent and spin-dependent (dark-matter-electron) scattering cross sections which, depending on the modelization of the source, can improve on other currently available bounds for light DM candidates of one up to five orders of magnitude.

In-person participation

Yes

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