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Dark Matter Neutrino Scattering in the Galactic Centre

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While there is evidence for the existence of dark matter, its properties have yet to be discovered. Similarly, the nature of high-energy astrophysical neutrinos detected at the IceCube Neutrino Observatory remains unresolved. If dark matter and neutrinos are coupled to each other, they may exhibit a non-zero elastic scattering cross section. Such an interaction between an extragalactic neutrino flux and dark matter would be concentrated in the galactic centre, where the dark matter column density is the greatest. This scattering would attenuate the flux of high energy neutrinos, which could be observed at the IceCube Neutrino Observatory. Using TeV to PeV neutrinos, we perform an unbinned likelihood analysis using the seven-year medium energy starting event (MESE) cascade dataset to explore the sensitivities to this indirect detection of dark matter for four possible DM-neutrino interaction scenarios.

Collaboration name

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