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All-flavor searches for dark matter with the IceCube neutrino observatory

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Dark matter particles can be trapped in massive celestial bodies, such as the Sun or the Earth. Their self-annihilations may produce standard model particles, including neutrinos of all flavors. Recent developments of reconstruction tools have allowed us to reconstruct electron and tau neutrino interactions with adequate angle and energy resolutions and to estimate the corresponding uncertainties. IceCube's in-fill array DeepCore, when using the outer IceCube detector as a veto, permits us to extend such studies to energies well below neutrino energies of 100 GeV. This is particularly important for the search of Weakly Interacting Massive Particles (WIMPs) that accumulate in the center of the Earth, as their annihilation rate is expected to be enhanced for WIMP masses around 50 GeV/c². All-flavor neutrino searches, in principle, enhance IceCube's sensitivity with respect to previous searches based solely on muon neutrinos.

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