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Limits on WIMP-Scattering Cross Sections using Solar Neutrinos with Ten Years of IceCube Data

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Although dark matter (DM) comprises 85% of the matter content of the Universe, its nature remains unknown. One broad class of particle DM motivated by extensions of the Standard Model (SM) is weakly interacting massive particles (WIMPs). Generically, WIMPs will scatter off nuclei in large celestial bodies such as the Sun, thus becoming gravitationally bound. Subsequently, WIMPs can annihilate to stable SM particles, ultimately releasing most of their energy as high-energy neutrinos which escape from the Sun. Thus, an excess of neutrinos from the Sun's direction would be evidence for WIMPs. The IceCube Neutrino Observatory is well-suited to such searches since it is sensitive to WIMPs with masses in the region preferred by supersymmetric extensions of the SM. I will present the results of IceCube's most recent solar WIMP search, which includes all neutrino flavors, covers the WIMP mass range from 10 GeV to 10 TeV, and has world-leading sensitivity over this entire range for most channels considered.

Collaboration(s)

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