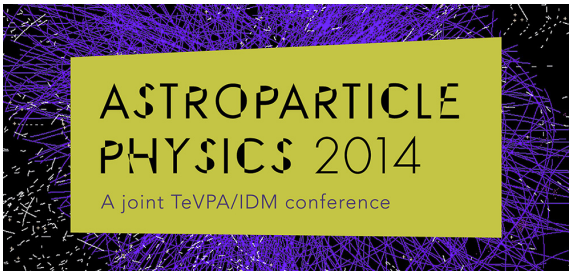


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# Higher order dark matter annihilations in the Sun and implications for IceCube

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Dark matter particles captured in the Sun would annihilate producing a neutrino flux that could be detected at the Earth. In some channels, however, the neutrino flux lies in the MeV range and is thus undetectable at IceCube, namely when the dark matter particles annihilate into electrons, muons or light quarks. In this talk we show that the same interaction that mediates the annihilations into light fermions also necessarily leads, via higher order effects, to the production of weak gauge bosons that generate a high energy neutrino flux potentially observable at IceCube. We then present limits on the scattering cross section of dark matter particles with protons in scenarios where the dark matter particle couples to electrons, muons or light quarks, using latest IceCube data. Interestingly, we find that the limits on the spin-dependent scattering cross section are, for some scenarios, stronger than the limits from direct detection experiments.

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