

Constraining EeV-Scale Dark Matter with Neutrino Observatories Using Tau Regeneration

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In 2016 and 2018, the ANITA collaboration reported the observation of two anomalous events, with polarizations consistent with up-going neutrinos, but coming from too far below the horizon to actually make it through the Earth given their energies. While all Standard Model (SM) explanations of these events have been ruled out, explanations from beyond Standard Model scenarios have been put forth in the literature, including scenarios in which these events arise from heavy dark matter decay to SM particles. In this contribution, we use tau neutrino regeneration to constrain one such explanation. Using ANTARES and IceCube public data, we look for an excess of neutrinos coming from this dark matter decaying in the Galactic Center and the Sun. Furthermore, we show the first accurate simulation of tau neutrino regeneration in the Sun.

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Dark matter

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