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Constraining non-standard Dark Matter-Nucleon Interactions with IceCube

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After scattering off nuclei in the Sun, dark matter particles can be gravitationally captured by the Sun, accumulate in the Sun's core and annihilate into Standard Model particles. Neutrinos originating from these annihilations can be detected by the IceCube Neutrino Observatory, located at the South Pole. Due to the non-observation of these neutrinos, constraints on the standard spin-dependent and spin-independent dark matter-nucleon scattering cross sections have been placed. Based on these constraints, we present upper limits on the coupling constants of the non-relativistic effective theory of dark matter-nucleon interactions, including velocity and momentum dependent interactions.

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