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Dark Matter - Neutrino Scattering at the Galactic Center

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Evidence for the existence of dark matter strongly motivates the efforts to study its unknown properties. Additionally, the origin of high-energy astrophysical neutrinos detected by IceCube remains uncertain. If dark matter and neutrinos couple to each other, we can search for a non-zero elastic scattering cross section. The interaction between an isotropic extragalactic neutrino flux and dark matter would be concentrated in the Galactic Center, where the dark matter column density is largest. The flux of high-energy neutrinos would be attenuated by this scattering, and the resulting signal, with correlated energy and arrival direction, can be observed in IceCube. Using the seven years of IceCube data, we perform an unbinned likelihood analysis, searching for several potential DM-neutrino interaction scenarios.

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