

Abstract Submitted
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Can cold neutrons give hint to understanding nature of dark matter? BEN RYBOLT, Univ of Tennessee, Knoxville — The composition of Dark Matter remains a mystery despite numerous searches. We explore an alternative to the WIMP paradigm in which Ordinary Matter and Dark Matter “Mirror” sectors are made of the same particles with the Standard Model interactions in each sector, except two sectors do not interact with each other by the Standard Model interactions. They only interact gravitationally and by some BSM mechanisms that can mix neutral components from both sectors. Thus, for example, photons can mix with sterile mirror photons via “kinetic mixing” mechanism, neutrinos can oscillate into sterile mirror neutrinos, and neutrons into sterile mirror neutrons. I explore the possibility to search for this Dark “Mirror” Sector by looking at mixing between neutron and mirror neutron. This can be done in a cold neutron beam where neutrons can oscillate into mirror neutrons and pass through a neutron absorber and then transform back into ordinary neutrons where they are detected. The regeneration of neutron depends on the magnitude and direction of a magnetic field.

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