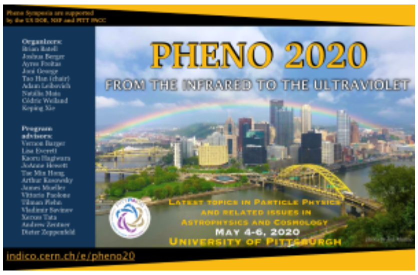

Contribution ID: **1006** Type: **Parallel Talk**

Absorption of Fermionic Dark Matter by Nuclear Targets

Monday 4 May 2020 18:15 (15 minutes)

Absorption of fermionic dark matter leads to a range of distinct and novel signatures at dark matter direct detection and neutrino experiments. We study the possible signals from fermionic absorption by nuclear targets, which we divide into two classes of four Fermi operators: neutral and charged current. In the neutral current signal, dark matter is absorbed by a target nucleus and a neutrino is emitted. This results in a characteristically different nuclear recoil energy spectrum from that of elastic scattering. The charged current channel leads to induced β decays in isotopes which are stable in vacuum as well as shifts of the kinematic endpoint of β spectra in unstable isotopes. To confirm the possibility of observing these signals in light of other constraints, we introduce UV completions of example higher dimensional operators that lead to fermionic absorption signals and study their phenomenology. Most prominently, dark matter which exhibits fermionic absorption signals is necessarily unstable leading to stringent bounds from indirect detection searches. Nevertheless, we find a large viable parameter space in which dark matter is sufficiently long lived and detectable in current and future experiments.

Summary

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