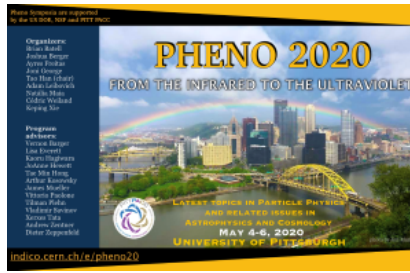


Phenomenology 2020 Symposium



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FIMP dark matter at the KOTO experiment

Monday 4 May 2020 17:45 (15 minutes)

The KOTO experiment has reported an excess of $K_L \rightarrow \pi^0 \bar{\nu} \nu$ events above standard model expectations. New physics interpretations of an excess in this channel are constrained by the Grossman-Nir bound, but another possibility is that the observed events in fact originate from a different process entirely: a decay of the form $K_L \rightarrow \pi^0 \phi$, where ϕ denotes one or more new invisible species. We introduce a set of fiducial models to study this scenario, and we examine the possibility that ϕ may also account for cosmological dark matter. We show that ϕ is in fact a natural dark matter candidate, and that it is readily produced non-thermally, particularly with a low reheating scale. We discuss astrophysical and terrestrial signatures that may allow further tests of this paradigm.

Summary

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