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A Nu Hope: Probing New Physics at the Neutrino Detectors

Tuesday 9 May 2017 18:00 (15 minutes)

In this talk we discuss the sensitivity of probing light scalars in the Borexino detector, and the possibility of detecting heavy leptons in the SHiP and DUNE experiments.

First we address in detail the sensitivity of the Borexino-SOX configuration in detecting light scalar particles coupled to the SM fermions. Within one year of operations one can achieve an unprecedented sensitivity to the coupling constants of such scalars, probing significant parts of parameter space that are not excluded either by the beam dump constraints or astrophysical bounds. These light scalars were proposed to explain the anomaly in the measurements of charge radius of the proton, and such explanation in its simplest form can be definitely tested in our setup.

We then move on to briefly discuss the possibility of utilizing SHiP and DUNE experiments to probe long-lived heavy leptons.

Summary

This talk is about probing new physics beyond Standard Model in the high intensity and low energy front.

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