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Fixed target probes for the Higgs portal

Thursday 10 June 2021 11:57 (3 minutes)

High-luminosity fixed target experiments provide impressive sensitivity to new light weakly coupled degrees of freedom. In this talk, I will discuss the minimal case of a scalar singlet S coupled to the Standard Model through the Higgs portal, that decays visibly to leptons for scalar masses below the dipion threshold. This UV-complete portal from the SM to a dark sector is of particular interest as one of the generic mediation channels for the interaction with dark matter. The existing dataset from the LSND experiment is found to impose the leading constraints within two mass windows between $m_S \sim 100$ and 350 MeV. In the process, we analyze a number of scalar production channels in the target, finding that proton bremsstrahlung provides the dominant channel at LSND beam energies.

Reference:

arXiv:2004.14515

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