

Phenomenology 2015 Symposium



Contribution ID: 19

Type: parallel talk

A Dark Side of Neutrino Mass

Tuesday 5 May 2015 14:45 (15 minutes)

We propose a simple scenario that directly connects the dark matter (DM) and neutrino mass scales. Based on an interaction between the DM particle χ and the neutrino ν of the form $\chi\chi\nu\nu/\Lambda^2$, the DM annihilation cross section into the neutrino is determined and a neutrino mass is radiatively induced. Using the observed neutrino mass scale and the DM relic density, the DM mass and the effective scale Λ are found to be of the order MeV and GeV, respectively. We construct an ultraviolet-complete toy model based on the inverse seesaw mechanism which realizes this potential connection between DM and neutrino physics.

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Session Classification: Dark Matter III