

Scalars 2023

Contribution ID : 18

Sterile neutrino dark matter from dark thermal bath

Friday 15 Sep 2023 at 13:30 (00h15')

Content :

Long-lived sterile neutrinos can play the role of dark matter. We consider the possibility that such neutrinos form a thermal bath with a singlet scalar, while not being in thermal equilibrium with the Standard Model fields. Eventually, the neutrino dark matter undergoes freeze-out in the dark sector, which can occur in both non-relativistic and relativistic regimes. To account for the latter possibility, we use the full Fermi-Dirac and Bose-Einstein distribution functions with effective chemical potential in the reaction rate computation. This allows us to study the freeze-out process in detail and also obtain the necessary thermalization conditions. We find that relativistic freeze-out occurs in a relatively small part of the parameter space. In contrast to the standard weakly-interacting-massive-particle (WIMP) scenario, the allowed dark matter masses extend to 10^4 TeV without conflicting perturbativity.

Primary authors : Dr. TOMA, Takashi (Kanazawa University)

Co-authors : Prof. LEBEDEV, Oleg (Helsinki University)

Presenter : Dr. TOMA, Takashi (Kanazawa University)

Session classification : Parallel Session 2

Track classification : --not yet classified--

Type : --not specified--