

Sterile neutrino dark matter in Inverse Seesaw realizations

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In this work we consider a simple extension of the Standard Model involving additional fermionic singlets and assume an underlying inverse seesaw mechanism for neutrino mass generation. In a first stage we determine which are the minimal inverse seesaw realisations that account for neutrino data while at the same time complying with all experimental requirements (electroweak precision tests and laboratory constraints). We show that in the class of models giving rise to a 3-flavour mixing scheme, only two mass scales are relevant (the light neutrino mass scale, m_ν and the mass of the right-handed neutrinos, M_R) while in the case of a 3+1-mixing scheme, an additional mass scale ($\mu \in [m_\nu, M_R]$) is required. Depending on its mass, the light sterile neutrino that is present in the latter class of models can give an explanation for the reactor anomalies or provide a possible candidate for the dark matter of the Universe. In a second stage we discuss the viability of the warm dark matter hypothesis imposing the present bounds on abundance, structure formation and neutrino radiative decay width.

Authors: ARCADI, Giorgio; Mr LUCENTE, Michele (LPT Orsay & SISSA); ASMAA, abada (Unknown)

Presenter: Mr LUCENTE, Michele (LPT Orsay & SISSA)

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