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Phenomenological study of keV scale sterile neutrino dark matter with S_4 flavor symmetry

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Searching for the cosmological origin, constituents and the interactions of dark matter
has been a great challenge to the fundamental science today. With the motivation of connecting dark matter phenomenology with neutrino, we have chosen inverse seesaw ISS (2,3) framework which is the extension of the standard model by the addition of two right handed neutrinos and three sterile fermions. The significance of the model is that it leads to a light sterile state with the mass in the keV range along with three light active neutrino states. The lightest sterile neutrino in keV scale can account for a feasible dark matter(DM) candidate. To strengthen our dark matter model, S_4 flavor symmetry has been incorporated which is further augmented by $Z_4 \times Z_3$
symmetry to constrain the Yukawa Lagrangian. We have performed detailed numerical
analysis including the calculation of DM mass and mixing with the active
neutrinos, decay rates of possible interaction as well as the relic abundance which are the key factors for considering sterile neutrino as a viable dark matter candidate. We constrain the parameter space of our model with the latest astrophysical and cosmological data.

Secondary track (number)

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