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Neutrino-Dark Matter Interaction and Bent Seesaw models

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Neutrinos from the standard model of particle physics are massless. However, there have been evidences of the neutrino oscillation indicating that some neutrinos possess tiny but non-zero masses. To describe this phenomenon, new physics at a higher scale, such as seesaw mechanism, is required. The beyond standard model behavior of neutrinos also coincides remarkably with the presence of the dark matter. In this talk, we are exploring possible connections between dark matter and neutrinos in the context of bent seesaw models. Motivating from dark matter constraints, we study a class of models which include 2 fermion singlets and a new scalar field. The standard model-like left-handed neutrinos obtain their masses from seesaw mechanism with the additional fermions. Whereas the additional scalar field is responsible for generating mass for the heavy fermions via symmetry breaking effects. The possible candidates of dark matter from the model will be discussed. Dark matter originated from the neutrino sector also allows us to derive limits on relevant parameters space from experiments such as ICECUBE and KamLAND. Some preliminary results on such limits will be presented.
Keywords: Dark matter, neutrino, seesaw mechanism, dark matter annihilation, particle physics, cosmology

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