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Probing the nature of neutrinos under the supersymmetric U(1) B-L Model YU GAO, University of Texas A&M, ROUZBEH ALLAHVERDI, University of New Mexico, SHELDON CAMPBELL, Ohio State University, BHASKAR DUTTA, Texas A&M University — This talk presents the prospects for determining the nature of neutrinos in the context of a supersymmetric $B - L$ extension of the standard model by using dark matter indirect detection signals and bounds on $N_{\rm eff}$ from the cosmic microwave background data. The model contains two new dark matter candidates whose dominant annihilation channels produce more neutrinos than neutralino dark matter in the minimal supersymmetric standard model. The photon and neutrino counts may then be used to discriminate between the two models. If the dark matter comes from the B-L sector, its indirect signals and impact on the cosmic microwave background can shed light on the nature of the neutrinos. When the light neutrinos are of Majorana type, the indirect neutrino signal from the Sun and the galactic center may show a prompt neutrino box-feature, as well as an earlier cut-off in both neutrino and gamma ray energy spectra. When the light neutrinos are of Dirac type, their contribution to the effective number of neutrinos $N_{\rm eff}$ is at a detectable level.

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