Contribution ID: **118** Type: **not specified**

MeV dark matter in the 3 + 1 + 1 model

Tuesday 7 May 2013 15:00 (15 minutes)

The existence of light sterile neutrinos in the eV mass range with relatively large mixing angles with the active neutrinos has been proposed for a variety of reasons, including to improve the fit to the LSND and MiniBooNE neutrino oscillation experiments, and reactor disappearance experiments. In ref. arXiv:1010.3970, it was shown that neutrino mixing with a heavier sterile neutrino, in the mass range between 33 eV and several GeV, could significantly affect and improve the agreement between of neutrino oscillation models with light sterile neutrinos and short baseline experimental results, allowing for a new source of CP violation in appearance experiments and for different apparent mixing angles in appearance and disappearance experiments. However in ref. arXiv:1205.1791, it was shown that a variety of collider experiment, supernovae, and cosmological constraints can eliminate most of the parameter region where such a heavy sterile neutrino can have a significant effect on neutrino oscillations. In this paper we consider the effects of allowing a new light scalar in the MeV mass region, which is a potential dark matter candidate, to interact with the sterile neutrinos, and show that the resulting model is a consistent theory of neutrino oscillation anomalies and dark matter which can also potentially explain the INTEGRAL excess of 511 keV gamma rays in the central region of the galaxy.

Author: HUANG, Jinrui (Los Alamos National Laboratory)

Co-author: NELSON, Ann (University of Washington)

Presenter: HUANG, Jinrui (Los Alamos National Laboratory)

Session Classification: Neutrinos III