Contribution ID: **96** Type: **not specified**

Chasing dark matter substructures in electron recoil direct detection experiments

Monday 23 January 2023 14:30 (20 minutes)

Recent sky surveys have discovered a large number of stellar substructures. It is highly likely that there are dark matter (DM) counterparts to these stellar substructures. We examine the implications of DM substructures for electron recoil (ER) direct detection (DD) rates in dual-phase xenon experiments. We have utilized the results of the LAMOST survey and considered a few benchmark substructures in our analysis. Assuming that these substructures constitute $\sim 10\%$ of the local DM density, we study the discovery limits of DM-electron scattering cross sections considering one kg-year exposure and 1 electron threshold. With this exposure and threshold, it is possible to observe the effect of the considered DM substructure for the currently allowed parameter space. We also explore the sensitivity of these experiments in resolving the DM substructure fraction. For all the considered cases, we observe that DM having mass $\mathcal{O}(10)$ MeV has a better prospect in resolving substructure fraction as compared to $\mathcal{O}(100)$ MeV scale DM.

Author: MAITY, Tarak Nath (Indian Institute of Science)

Co-author: Dr LAHA, Ranjan (Indian Institute of science (IN))

Presenter: MAITY, Tarak Nath (Indian Institute of Science)