Contribution ID: **414** Type: **Talk**

Boosting through the Darkness

Wednesday 14 December 2022 16:45 (15 minutes)

The recoil threshold of Direct Detection experiments limits the mass range of Dark Matter (DM) particles that can be detected, with most DD experiments being blind to sub-MeV DM particles. However, these light DM particles can be boosted to very high energies via collisions with energetic Cosmic Ray electrons. This allows Dark Matter particles to induce detectable recoil in the target of Direct Detection experiments. We derive constraints on scattering cross section of DM and electron, using XENONnT and Super-Kamiokande data. Vector and scalar mediators are considered, in the heavy and light regimes. We discuss the importance of including energy dependent cross sections (due to specific Lorentz structure of the vertex) in our analysis, and show that the bounds can be significantly different than the results obtained assuming constant energy-independent cross-section, often assumed in the literature for simplicity. Our bounds are also compared with other astrophysical and cosmological constraints as well as bounds arising out of collider experiments.

Session

Astroparticle Physics and Cosmology

Authors: Dr GUHA, Atany (Chungnam National University); BARDHAN, Debjyoti (IISER Pune); Dr GHOSH, Diptimoy (IISER Pune); Dr SACHDEVA, Divya (LPTHE); Ms BHOWMICK, Supritha (IISER Pune)

Presenter: BARDHAN, Debjyoti (IISER Pune)

Session Classification: WG1-Astroparticle Physics and Cosmology