Contribution ID: **132** Type: **not specified**

Light Dark Matter at LDMX: Dipole Emission and Global Fits

Thursday 29 May 2025 18:00 (20 minutes)

Sub-GeV dark matter (DM) has been gaining significant interest in recent years, since it can account for the thermal relic abundance while evading nuclear recoil direct detection constraints. Light DM does not carry enough momentum to be probed via nuclear recoils; other search strategies such as direct detection via electron recoils and accelerators are ideal. We focus on accelerator experiments, considering two main directions. First, we investigate the vast theory potential of accelerator based experiments, in particular fixed target experiments such as LDMX. We consider dark photons with additional loop induced interactions, namely higher order dark electromagnetic moments –leading to different signatures at LDMX than the ordinary kinetic mixing interaction.
Secondly, we compare constraints from laboratory experiments, and from astrophysical and cosmological observations with the predictions of two sub-GeV DM models within frequentist and Bayesian global analyses using GAMBIT. We infer the regions in parameter space preferred by current data, and compare with projections of near-future experiments, providing a status update to sub-GeV DM.

Primary author: GRAY, Taylor (Chalmers University of Technology)

Presenter: GRAY, Taylor (Chalmers University of Technology)

Session Classification: Dark Matter and Dark Energy