Contribution ID: **12** Type: **not specified**

Extracting Dark-Matter Mass from Directional Observables

Friday 15 December 2023 11:00 (30 minutes)

We propose a novel method to determine the mass scale of ambient dark matter that can be generally applied to the (at least effectively) two-dimensional direct detection experiments allowing for directional observables. Due to the motions of the solar system and the Earth relative to the galactic center and the Sun, the dark-matter flux carries a directional preference. We first formulate that dark-matter event rates have a non-trivial dependence on the angle between the associated detection plane and the overall dark-matter flow and that the curvature of this angular spectrum encrypts the mass information. For proof of principle, we take the recently-proposed Graphene-Josephson-Junction-based superlight dark-matter detector (named as GLIMPSE) as a concrete example and demonstrate these theoretical expectations through numerical analyses.

Primary author: Prof. PARK, Jong-Chul (Chungnam National University (KR))

Co-author: KIM, Doojin (Texas A & M University (US))

Presenter: Prof. PARK, Jong-Chul (Chungnam National University (KR))