

## Constraints on cosmic-ray boosted dark matter from the XENONnT experiment

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Sub-MeV cold dark matter (DM) particles are unable to produce electronic recoil in the XENONnT experiment above the detector threshold. The mechanism of boosted dark matter (BDM) scenario comes into picture to constrain the parameter space of such low mass dark matter from direct detection experiments. We consider the effect of the leading components of cosmic rays to boost the cold DM. To present a concrete example, we choose to work on a model consisting of a Dirac fermion  $\chi$  with a new  $U(1)$  gauge symmetry while the new gauge boson  $A'$  being kinetically mixed with the standard model  $U(1)_Y$  gauge boson. We found that the energy dependence of the cross section plays a crucial role in improving the constraints. We also considered the earth shielding effect on BDM in losing energy while travelling to the underground detector through the earth. We present an approximate analytical estimate for this purpose.

### Secondary category for the parallel session (optional)

Astroparticle Physics

**Primary authors:** GUHA, Atanu (Chungnam National University); PARK, Jong-Chul (Chungnam National University)

**Presenter:** GUHA, Atanu (Chungnam National University)

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