

## Latest Constraints on Millicharged Particles Using ArgoNeuT

*Wednesday 22 May 2019 15:00 (20 minutes)*

Millicharged particles (mCPs) are theoretical particles with fractional electric charge, which could constitute part of the dark matter present in the Universe and can naturally arise in dark sectors with  $U(1)'$  gauge symmetries. We report the latest constraints to the parameter space of mCPs using data from ArgoNeuT, a 0.24 ton Liquid Argon Time Projection Chamber (LArTPC), with a novel phenomenological proposal of aligning doublet hits. ArgoNeuT was placed in the Neutrinos at the Main Injector (NuMI) neutrino beamline at Fermilab from 2009-2010. The 120 GeV proton beam which produced the neutrinos could also produce a large flux of mCPs which would interact in ArgoNeuT. In addition to setting limits, we describe the manner in which mCPs would be detected in LArTPCs.

**Primary author:** LEPETIC, Ivan (Illinois Institute of Technology)

**Presenter:** LEPETIC, Ivan (Illinois Institute of Technology)

**Session Classification:** Dark Matter, Astroparticle Physics

**Track Classification:** Dark Matter, Astroparticle Physics