



Contribution ID: 12

Type: **not specified**

Light dark matter search results from DarkSide-50

Wednesday, September 13, 2023 2:00 PM (20 minutes)

The DarkSide-50 experiment uses a two-phase argon time projection chamber to directly search for dark matter interactions. The energy threshold of the detector can be lowered by including ionization-only events. While background rejection is lost, DarkSide-50's sensitivity is expanded to sub-GeV dark matter candidates. The DarkSide-50's expanded search for several dark matter candidates with improved calibration model, more accurate background model, improved data selection, and larger exposure will be presented. The search has excluded new parameter space for spin-independent dark matter-nucleon coupling, dark matter-electron cross section, the axioelectric coupling constant of galactic ALPs, and the dark photon kinetic mixing parameter.

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Session Classification: DDM: Direct DM searches

Track Classification: Direct DM searches