Phenomenology 2019 Symposium



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Type: parallel talk

MeV-scale Direct Detection with SENSEI

Monday 6 May 2019 17:15 (15 minutes)

I will present new constraints on dark matter in the eV-to-GeV mass scale range, obtained by a prototype detector of the Sub-Electron-Noise Skipper-CCD Experimental Instrument (SENSEI). We took our first data in 2018 searching for dark matter-electron interactions in silicon and observe how many electrons are excited across the silicon band gap per event. We found no events with three or more electrons; however, we had some background of one- and two-electron events. We used this data to put the strongest bounds of any experiment so far on dark matter-electron scattering for masses between 500 keV to 5 MeV, and on dark-photon dark matter being absorbed by electrons for a range of masses below 12.4 eV. We expect SENSEI to push these bounds further in the near future with upcoming runs of larger exposures and with higher grade detectors and more significant background reduction.

Summary

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