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Demonstration of Single Ionization Sensitive Cryogenic Calorimeters and Their Potential In Electron Recoil Dark Matter Searches
MATTHEW PYLE, UC Berkeley

Substantial astronomical observations have established that approximately 25% of the energy density of the Universe is composed of cold non-baryonic dark matter, whose detection and characterization could be key to improving our understanding of the laws of physics. Over the past three decades, physicists have largely focused on searching for dark matter within the 10 GeV-1 TeV range (WIMPs), with ever more sensitive limits. The absence of a discovery has motivated us to broaden our experimental search program to look for dark matter throughout the mass range from 10^{-22} eV to 10^{19} GeV.

In this talk, we present results from the first search of the SuperCDMS collaboration for inelastic electronic recoils with low mass (500keV - 100MeV) dark matter and for eV scale bosonic dark matter using our new single ionization sensitive cryogenic calorimeters. Since the search was performed at the surface with minimal overburden, this search has implications for strongly-interacting dark matter particle models like those proposed to explain the anomalously large 21 cm signal observed by the EDGES collaboration.