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SuperCDMS Experiment at SNOLAB: Current Status and Recent CUTE Results

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The Super Cryogenic Dark Matter Search (SuperCDMS) experiment at SNOLAB explores dark matter particles in the widely unexplored mass range of $1\text{--}10\text{ GeV}/c^2$. The experiment will deploy a total of 24 detectors with silicon and germanium target substrates 2 km deep underground in SNOLAB. The detectors are arranged in four towers, combining the low-threshold sensitivity of high-voltage (HV) phonon detectors with the excellent background discrimination of phonon-charge (iZIP) detectors. The combination will give SuperCDMS a world-leading edge in exploring the low-mass, low-cross-section dark matter candidates.

Over the past year, SuperCDMS completed testing a single HV tower at the Cryogenic Underground TEst facility (CUTE). The CUTE run, which concluded in February 2024, demonstrated the ability to conduct in-situ operations including characterization, calibration, and exploration of Neganov-Trofimov-Luke (NTL) phonon amplification. This presentation will highlight key results from CUTE, along with the current status and prospects of the first SuperCDMS science run.

Collaboration(s)

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