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## Low-threshold Phonon-Mediated Hybrid Detectors with Background Discrimination

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Two important limitations hinder searches for low-mass dark matter and the reactor neutrino coherent scattering: Backgrounds and the threshold. SuperCDMS experiment is addressing both challenges by using two complementary and different technologies. Using simultaneous ionization and phonon measurement, SuperCDMS gains even-by-event background discrimination and addresses the background challenge and using internal high voltage phonon amplification and the unprecedented threshold thereof, it addresses the threshold challenge.

Our new hybrid phonon-only design provides an alternative that can address both challenges in a single monolithic detector. During the previous CPAD meeting, We presented the performance of a prototype hybrid detector down to  $\sim 1$  keV nuclear recoil threshold. Here we will present an update on our progress in reaching thresholds well below the existing technologies with background discrimination and our plans to reach single-electron resolution detectors with background discrimination.

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