## Abstract Submitted for the APR18 Meeting of The American Physical Society

150 mm Cryogenic Silicon Detector Testing and Development NICHOLAS MAST, MATTHEW FRITTS, ALLISON KENNEDY, University of Minnesota - Twin Cities, RUPAK MAHAPATRA, Texas A&M University, VUK MANDIC, University of Minnesota - Twin Cities, NADER MIRABOLFATHI, Texas A&M University, ANTHONY VILLANO, University of Minnesota - Twin Cities — The Super Cryogenic Dark Matter Search (SuperCDMS) experiment at SNOLAB plans to deploy a payload comprised of 100 mm diameter, 33 mm thick germanium and silicon ionization and phonon detectors. In order to scale up the sensitive mass of future searches, larger individual detectors are being investigated. In this talk I will present the first results of testing two prototype 150 mm diameter silicon ionization detectors. The detectors are 25 mm and 33 mm thick with masses 1.7 and 2.2 times larger than those planned for use in the SuperCDMS SNOLAB experiment. These devices were operated with contact-free bias electrodes to minimize leakage currents which currently limit operation at high bias voltages. One detector was instrumented to read out ionization signals using a single contact-free readout electrode and the other with an array of electrodes patterned on the crystal surface. I will discuss measurements of charge collection efficiency and energy resolution as well as event reconstruction models in these devices. The results show promise for the use of both large volume silicon detectors and contact-free electrode arrangements for scaling up solid state cryogenic detector mass and bias voltage.

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