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Low-energy event excess in SuperCDMS HVeV detectors

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The 1-gram silicon HVeV detectors developed within the Super Cryogenic Dark Matter Search (SuperCDMS) collaboration have achieved single-photon sensitivity and a baseline resolution of $\sigma = 2.7$ eV. These cryogenic calorimeters can be operated in two configurations: (1) as phonon-assisted charge amplifiers by exploiting the Neganov-Trofimov-Luke (NTL) effect; (2) without NTL voltage (0V) by simply measuring recoil energies. The HVeV detectors observed an excess of events in the low energy region, as have several other experiments in the field. In this talk, I will present a study of the low-energy event excess through a comparison of the NTL-amplified data and the 0V data. The observed excess is consistent with a scintillation/luminescence hypothesis from the material holding the device.

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