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Charge Trapping in Germanium Dark Matter Detectors ARRAN PHIPPS, Univ of California - Berkeley, CDMS COLLABORATION — Experiments such as CDMS and EDELWEISS operate arrays of high purity germanium detectors in an effort to directly detect dark matter. Discrimination between electron recoil background events and nuclear recoil signal events is performed by the simultaneous measurement of ionization and phonons. The detectors are operated in a unique regime of low temperature (∼50mK) and low electric field (∼V/cm). Both experiments observe a degradation in charge collection efficiency over time, presumed to be due to space charge buildup caused by poorly-understood charge carrier trapping processes, requiring the detectors undergo a periodic reset procedure. We have performed an experiment to measure charge trapping in CDMS detectors as a function of electric field for electrons and holes. We present measured drift velocities and trapping lengths up to fields of ∼24V/cm and provide a novel theoretical interpretation which is in good agreement with the data. We discuss the implications of these results for future germanium dark matter detectors.

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