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Modeling Low-Energy Nuclear Quenching in SuperCDMS Using Neutron Capture Data[1] JUDY PANMANY, HANNAH KINNEY, St. Catherine University, SUPERCDMS COLLABORATION — Dark matter (DM) is an invisible, non-luminous substance that constitutes approximately 85% of the matter in the universe. Since DM is an elusive substance attributable to its low mass and energy, the detection of DM events is exceedingly rare and difficult to measure. Deciphering the nature of DM would be of importance to understanding a large portion of our universe. The Super Cryogenic Dark Matter Search (SuperCDMS) is amongst several collaborations that perform experiments to directly detect DM particles. In this research, preliminary SuperCDMS data from the University of Minnesota test facility were analyzed by comparing neutron capture data to simulated events with four different yield models applied. Yield is a model of energy loss for nuclear recoil events. The typically assumed yield model does not account for low energy events, therefore, assumptions must be made. A spectral shape analysis suggests that the Sorensen model is the most suitable fit for the low-energy data. With further analysis, data analyzers will be able to make more guided choices regarding assumptions about DM events at low energy.

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