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Energy Reconstruction for Low Energy Supernova Neutrinos RACHEL PROCTER-MURPHY, Arizona State University, JOHN LOSECCO, University of Notre Dame, DUNE COLLABORATION — The Deep Underground Neutrino Experiment is an international experiment through the Fermi National Accelerator Laboratory that will study neutrinos. In this study, we examined at the detector effects on low energy supernova neutrinos in order to improve energy reconstruction at energies less than 40 MeV. In order to do this we looked at supernova neutrino events in a LarSoft detector simulator with and without background. We looked at the ratios between the true data and reconstructed data to identify the deficiencies of the detector, which we found to be low energies and high drift times. We also improved the ratio between the true and reconstructed data by applying the physical limits of the detector. The efficiency of the improved ratio of the clean data was 93.2% and the efficiency of the improved ratio with the data with background was 82.6%. We concluded that a second photon detector at the far wall of the detector would help improve the resolutions at high drift times and low energies.

Rachel Procter-Murphy
Arizona State University

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