Abstract Submitted
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Studying neutrino charged-current interactions in the COHERENT liquid argon detectors[1] ERIN CONLEY, Duke University, COHERENT COLLABORATION — A core-collapse supernova burst (SNB) releases 99% of a star's gravitational potential energy via neutrinos over a period of several seconds. These neutrinos have energies in the few to 10s of MeV range. Lack of knowledge of low-energy neutrino cross sections will limit the amount of physics extracted during a future SNB. In particular, the electron neutrino-argon charged-current inelastic interaction (ν_eCC) cross section has never been measured at the SNB neutrino energy range. Furthermore, different cross section calculations are only theoretically motivated and contain significant variations when comparing different models. The COHERENT liquid argon (LAr) detector, known as CENNS-10, observes neutrinos with energies in the 10s of MeV at the Spallation Neutron Source at Oak Ridge National Laboratory. The proposed upgrade to CENNS-10, known as CENNS-750, will have a larger fiducial volume and the possibility to optimize both the detector design and data acquisition to detect the ν_eCC interaction. The COHERENT LAr detectors provide current and future opportunities to study the ν_eCC interaction at the relevant neutrino energy range for SNB neutrinos. This talk will detail simulation studies focused on COHERENT LAr detector sensitivity to the ν_eCC interaction.

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