

Abstract Submitted
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Sensitivity of the Helium and Lead Observatory to Supernova Neutrino Spectra KATE SCHOLBERG, Duke University — Neutrinos in the few tens-of-MeV range will produce neutrons when interacting with lead via both charged and neutral current interactions. The production of single and double neutron events is highly dependent on neutrino energy. The Helium and Lead Observatory (HALO) is a detector designed to exploit the neutrino-lead interaction in order to measure a burst of neutrinos from a nearby supernova. HALO is under construction at SNOLAB, making use of recycled lead ingots and ^3He counters from the SNO experiment. The relative rates of single and double neutrons observed for a supernova burst will provide unique information about the spectra of electron flavor as well as muon and tau flavor neutrinos and antineutrinos. Here we present studies of the sensitivity to different supernova models and neutrino oscillation parameters of the 79-tonne HALO1 detector and of a possible future upgrade to 1 kilotonne of lead.

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