

Abstract Submitted
for the APR18 Meeting of
The American Physical Society

Neutrino scattering in supernovae and spin correlations of a unitary gas ZIDU LIN, CHARLES HOROWITZ, Indiana Univ - Bloomington — Core collapse supernova simulations can be sensitive to neutrino interactions near the neutrinosphere. This is the surface of last scattering. We model the neutrinosphere region as a warm unitary gas of neutrons. A unitary gas is a low density system of particles with large scattering lengths. We calculate modifications to neutrino scattering cross sections because of the universal spin and density correlations of a unitary gas. These correlations can be studied in laboratory cold atom experiments. We find significant reductions in cross sections, compared to free space interactions, even at relatively low densities. These reductions could reduce the delay time from core bounce to successful explosion in multidimensional supernova simulations.

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Date submitted: 08 Jan 2018

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