

Abstract Submitted
for the APR18 Meeting of
The American Physical Society

Beta equilibrium in neutron star merger conditions STEVEN HARRIS, MARK ALFORD, Washington Univ — Conventionally, neutrino-transparent nuclear matter is said to be in beta equilibrium if the electron and proton chemical potentials add up to the neutron chemical potential. We find that at temperatures above 1 MeV, which are reached in neutron star mergers and supernovae, the traditional criterion of beta equilibrium needs to be modified by adding an isospin chemical potential of order 10 MeV. This modification of beta equilibrium alters the direct and modified Urca rates for densities above and below the direct Urca threshold density, which has implications for the bulk viscosity of neutron star mergers.

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Date submitted: 11 Jan 2018

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