Contribution ID: **74**   Type: **Talk [Main Conference]**

Matter-neutrino resonance transitions above a neutron star merger remnant

Tuesday, 7 February 2017 10:15 (15 minutes)

We perform a study of the matter neutrino resonance (MNR) phenomenon in neutron star mergers based on a model employing three-dimensional merger simulations. The matter-neutrino resonance (MNR) phenomenon has the potential to significantly alter the flavor content of neutrinos emitted from compact object mergers. We present the first calculations of MNR transitions using neutrino self-interaction potentials and matter potentials generated self-consistently from a dynamical model of a three-dimensional neutron star merger. In the context of the single angle approximation, we find that symmetric and standard MNR transitions occur in both normal and inverted hierarchy scenarios. We examine the spatial regions above the merger remnant where propagating neutrinos will encounter the matter-neutrino resonance and find that a significant fraction of the neutrinos are likely to undergo MNR transitions. This change of flavor content potentially influences the neutrino dynamics and electromagnetic emission from the remnants and could have broad ramifications in diverse fields, including high energy astrophysics.

Primary author: Mr ZHU, Yonglin (North Carolina State University)

Co-authors: Dr PEREGO, Albino (TU-Darmstadt); MCLAUGHLIN, Gail (North Carolina State University)

Presenter: Mr ZHU, Yonglin (North Carolina State University)

Session Classification: Session 1

Track Classification: Contributed talk