

Study of thermal neutrinos in short gamma-ray bursts

Compact object binary mergers; neutron star-neutron star or neutron star-black hole have amply been discussed as progenitors of short gamma-ray bursts (sGRBs). Whereas the strength of magnetic field in a neutron star-black hole merger can be $\sim 10^{12}$ G, in a binary neutron star system, the magnetic field could be amplified beyond ($\sim 10^{15} - 10^{16}$) G. By calculating the effective neutrino potential up to order M_W^{-4} , we study the emission, propagation, and oscillation of multi MeV-GeV neutrinos in these mergers. In addition, we calculate the neutrino opacity in a GRB event, finding that neutrinos do not escape isotropically but they are collimated in a preferential direction along the jet propagation way. This gives us a powerful tool to discriminate the mechanism by which a GRB is originated. As particular case, we calculate the number of neutrino events expected on several ground-based neutrino telescopes for the GW170817/GRB170817A event.

Session and Location

Wednesday Session, Poster Wall #190 (Ballroom)

Poster included in proceedings:

yes

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