Beitrag ID: **71** Typ: **nicht angegeben**

Systematic study of binary neutron star mergers with neutrinos

Dienstag, 24. September 2024 12:05 (20 Minuten)

We perform a systematic study of binary neutron star (BNS) mergers using relativistic hydrodynamical simulations with neutrinos by considering different total masses, mass ratios and different equations of state. By comparing asymmetric mergers to the corresponding symmetric mergers with the same total mass, we observe a systematic decrease in the dominant oscillation frequencies and an approximate plateau of maximum densities in the postmerger evolution. In the remnants of asymmetric mergers, we find higher temperatures, higher average electron fractions, and higher neutrino luminosities. Specifically, we examine the dynamical ejecta properties, including the mass ejection, the composition, and the elemental abundance production through nucleosynthesis calculations. We notice that the ejecta from asymmetric mergers exhibit an overall increase in the isotropy per unit angular bin, an increase in the ejecta mass and the mass-averaged temperatures. The electron fraction distribution of the ejecta tends toward lower values, resulting in more neutron-rich ejecta and yields a higher lanthanide fraction in asymmetric mergers compared to symmetric counterparts.

Hauptautor: VIJAYAN, Vimal (GSI Helmholtzzentrum für Schwerionenforschung GmbH(GSI))

Co-Autoren: BAUSWEIN, Andreas (GSI Helmholtzzentrum für Schwerionenforschung GmbH(GSI)); MARTINEZ PINEDO, Gabriel (GSI Helmholtzzentrum für Schwerionenforschung GmbH(GSI))

Vortragende(r): VIJAYAN, Vimal (GSI Helmholtzzentrum für Schwerionenforschung GmbH(GSI))

Sitzung Einordnung: Session