

Abstract Submitted
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GRMHD Simulations of Binary Neutron Star Mergers: 100 ms of Long-Lived Merger Evolution¹ JAY VIJAY KALINANI, University of Padova, Italy, RICCARDO CIOLFI, INAF - Astronomical Observatory of Padova, Italy, WOLFGANG KASTAUN, Max Planck Institute for Gravitational Physics (AEI), Hannover, Germany, BRUNO GIACOMAZZO, University of Milan - Bicocca, Italy — Recent multimessenger observation of the short gamma-ray burst (SGRB) GRB 170817A together with the gravitational wave (GW) event GW170817 provides evidence for the long-standing hypothesis associating SGRBs with binary neutron star (BNS) mergers. The nature of the remnant object powering the SGRB, which could have been either an accreting black hole (BH) or a long-lived magnetized neutron star (NS), is however still uncertain. In this talk, I will present our work based on exploring the case of long-lived NS as a possible SGRB jet central engine by performing a general relativistic magnetohydrodynamic BNS merger simulation extending up to about 100 milliseconds after merger, much longer than any previous simulation of this kind. In particular, I will focus on the overall merger dynamics, structure and rotation profile of the formed post-merger remnant, evolution of magnetic fields, followed by arguments based on our simulation results on jet-formation by such a scenario.

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