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The effect of muons production and neutrino trapping on Binary Neutron Star merger remnants

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A deep understanding of the dynamics of Binary Neutron Star (BNS) mergers requires a detailed treatment of the relativistic hydrodynamics of the merger, as well as of the microphysics governing the underlying electromagnetic, strong, and weak interactions. Accurate numerical simulations are pivotal to correctly interpret the data collected through the detection of gravitational waves and electromagnetic counterparts.

State-of-the-art simulations do not include muons in the microphysics of the system, even though physical muon creation is possible in such conditions. As a consequence, muonic neutrinos are not distinguished by tauonic ones. Moreover, the contribution of trapped neutrinos to the thermodynamic quantities characterizing the remnant is usually neglected. During my talk, I will discuss the consequences of muons creation and neutrino trapping on the properties of BNS merger remnants.

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