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Numerical relativity informed models of the electromagnetic counterpart of neutron star mergers

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Neutron star merger is a unique cosmic laboratory to investigate general relativity in a strong field regime and fundamental physics, including dense matter and heavy-elements-nucleosynthesis.

Our work focuses on the electromagnetic counterpart of the gravitational wave source GW170817. We study the merger dynamics and light curves employing the state of the art numerical, general relativistic simulations with microphysics.

We find that cases with long-lived remnants exhibit a quasi-steady outflow, powered by the interaction between the remnant and the surrounding disk. The outflow has distinct from well known dynamical ejecta properties and larger mass. Including it into the numerical-relativity informed kilonova models, we show that this component is imporntnat for understanding the early blue component of AT2017gfo.

Keywords

Compact Object Mergers

Primary author: NEDORA, Vsevolod (Theoretisch-Physikalisches Institut)

Co-author: BERNUZZI, sebastiano (Jena FSU)

Presenter: NEDORA, Vsevolod (Theoretisch-Physikalisches Institut)

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