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Neutron-star merger simulations including all phases of matter ejection

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Neutron star mergers lead to the ejection of multiple outflow components. Many existing neutron-star merger models cover only the first tens of milliseconds after the merger and can therefore only describe the early, dynamical ejecta. However, further matter ejection can take place during several seconds of evolution of the merger remnant. In this talk I will present our recent study [1] investigating long-term evolution models that consistently followed the dynamical ejecta together with the ejecta driven by the hyper-massive neutron-star as well as the subsequent black-hole torus system. Apart from the hydrodynamics properties I will discuss the nucleosynthesis yields and approximate kilonova light curves of these models.

[1] “End-to-end Kilonova Models of Neutron Star Mergers with Delayed Black Hole Formation”; O. Just, V. Vijayan, Z. Xiong, S. Goriely, T. Soultanis, A. Bauswein, J. Guilet, H.-Th. Janka, G. Martínez-Pinedo, *The Astrophysical Journal Letters*, 951, L12, 2023.

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