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Ultra-high energy neutrinos from neutron-star mergers

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In the context of the recent multi-messenger observation of neutron-star merger GW170817, we examine whether such objects could be sources of ultra-high energy astroparticles. At first order, the energetics and the population number is promising to envisage the production of a copious amount of high-energy particles, during the first minutes to weeks from the merger. In addition, the strong radiative and baryonic environment in the kilonova ejecta can be an important background causing energy losses for cosmic-ray nuclei and producing associated high-energy neutrino emissions. We model the evolution of the photon density and the baryonic density in the kilonova ejecta and calculate numerically the signatures in terms of ultra-high energy neutrinos.

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