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Constraints on nuclear equations of state from binary neutron star mergers

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Multi-messenger observations of binary neutron star mergers can provide essential information on the properties of the nuclear equation of state of these compact objects. We perform Bayesian inference on GW170817 and its kilonova counterpart AT2017gfo, constraining the radius of a neutron star of 1.4 M to 12.2±0.5 km (1σ level). Furthermore, we show how post-merger gravitational-waves can inform us on the high-density regimes: such observation would constrain the maximum central density of a non-rotating neutron star with an error of the order of ~15% at the 90\% confidence level.

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