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Implications from GW170817 and I-Love-Q relations for relativistic hybrid stars

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Gravitational wave observations of GW170817 placed bounds on the tidal deformabilities of compact stars allowing one to probe equations of state for matter at supranuclear densities. Here we design new parametrizations for hybrid hadron-quark equations of state and test them against GW170817. We find that GW170817 is consistent with the coalescence of a binary hybrid star-neutron star. We also find that the I-Love-Q relations for hybrid stars agree with those for realistic neutron stars and quark stars within $\sim 3\%$ for both slowly and rapidly rotating configurations [1]. We extend this initial study that used multipolytrope EoS and piecewise constant speed-of-sound modeling by a more realistic equation of state [2] with a strong deconfinement phase transition [2].

[1] V. Paschalidis et al., arxiv:1712.00451

[2] M. Bejger et al., A&A 600, A39 (2017).

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