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# On the properties of metastable hypermassive hybrid stars

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Hypermassive hybrid stars (HMHS) are extreme astrophysical objects that could be produced in the merger of a binary system of two neutron stars. In contrast to their purely hadronic counterparts, hypermassive neutron stars (HMNS), these highly differentially rotating objects contain deconfined strange quark matter in their slowly rotating inner region. HMHS and HMNS are both metastable configurations and can survive only shortly after the merger before collapsing to rotating black holes. The properties of a HMHS/HMNS (e.g. rotational property, density and temperature distribution) and the space-time distortion it causes, have been computed by fully general-relativistic hydrodynamic simulations [1-7] and the complicated dynamics of the collapse from a HMNS to a more compact HMHS have been analysed in detail [5,7]. The interplay between the density and temperature distributions and the differential rotational profiles in the interior of the HMHS after the collapse produces a clear gravitational wave signature of the production of quark matter, if the hadron-quark phase transition is strong enough. During the collapse of the HMHS to a Kerr Black the color degrees of freedom of the pure strange quark matter core gets macroscopically confined by the formation of the event horizon [4,6].

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