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A Systematic Analysis of Hybrid Stars Using a Hadronic Equation of State Suitable for Core-Collapse Supernovae

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Author(s) Heinimann, Oliver; Hempel, Matthias; Thielemann, Friedrich-Karl
Author(s) at UniBasel Hempel, Matthias ; Thielemann, Friedrich-Karl ; Heinimann, Oliver Philipp ;
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Our long-term goal is to develop a new supernova equation of state that meets the observational 2MŹ neutron star constraint and that includes quark matter. In this work, we perform a parameter scan to systematically investigate the hadron-quark phase transition in cold neutron stars using the state-of-the-art supernova equation of state HS(DD2) for the hadronic phase. We find neutron star configurations with maximum masses above 2MŹ and even above the maximum mass of HS(DD2). Our results show good agreement with other parameter scans.
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