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Hadron-quark phase transition in hybrid stars and first insights for generating a new supernova EoS

Thursday 28 April 2016 15:00 (20 minutes)

The subject of this presentation is the quark-hadron phase transition in neutron stars (NS) and core collapse supernovae (CCSN). We employ a hybrid equation of state consisting of the the state-of-the-art EOS HS(DD2) for the hadronic part and the constant speed of sound EOS for the quark phase. We show how this EOS is related to a standard bag model. We systematically vary the phase transition parameters, investigate the maximum masses and classify the resulting hybrid stars into four cases (as done in [1]). The problem of reconfinement is also discussed, which has not been considered in previous parameter scans. Finally, we explore if there is a parameter region where the hybrid EOS supports 2 M⊙ and that might be favorable for CCSN explosions at the same time. [1] M. G. Alford et al., Phys. Rev. D 88, 8, (2013)

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