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Towards a better understanding of dense matter with gravitational waves

- The observation of the tidal deformability extracted from GW170817 have been analyzed by many teams, leading to boundaries of the NS radius. In our analysis, we contrast continuous EoS with EoS with strong first order phase transitions showing that these two cases induce different constrain on global NS properties. We also explore the impact of low density neutron matter predictions from chiral EFT approach, and we show that our current nuclear physics knowledge is still a bit more constraining than GW170817 tidal deformability. We also analyze the required accuracy for the tidal deformability which can make it compete with nuclear knowledge and the one which could shed light on the presence of phase transition in the core of NS.

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