

# quasi normal oscillations in newly born compact star considering effects of phase transition

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The massive stars end their lives by supernova explosions, leaving central compact objects that may evolve into neutron stars. Initially, after birth, the star remains hot and gradually cools down. We explore the matter and star properties during this initial stage of the compact stars, considering the possibility of the appearance of deconfined quark matter in the core of the star. Nonradial oscillation in the newly born compact object is highly possible at the initial stage after the supernova explosion. Non-radial oscillations are an important source of GWs. There is a high chance for GWs from these oscillations, especially the nodeless fundamental ( $f$ ) mode, to be detected by next-generation GW detectors. We study the evolution in frequencies of non-radial oscillation after birth, considering the effects due to the presence of deconfined quark matter and predicting the possible signature for different possibilities of theoretical compact star models.

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