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Investigate the magnitude of gravitational wave due to quark-hyperon-transition during inside the neutron star WEIKANG LIN, BAO-AN LI, Texas A&M University-Commerce — In the next decade, it is hopeful to be able to detect gravitational waves. The detection of gravitational wave provides us a new way to investigate our universe or even the microscopic world, the nuclear matter for example. There is strong relation between the gravitational waves and the state of matter inside the neutron stars. Extreme environment might appear inside the neutron stars. Hyperons or even a transition from hadrons to quark matter might be presented. A hyperons-Quark transition might by a low mass neutron star acreting mass from its companion in an X-ray binary, or by spinning down and increasing the density at its central. We investigated the maximum energy available for stochastic gravitational waves generated by neutron stars through oscillations coupling with rotations during a phase transition from hadron matter to deconfined quark-gluon matter in the core of them. The energy difference, between the configurations with and without a quark-gluon matter core, is used to estimate the maximum available energy. The properties of neutron stars were computed using isospin- and momentum-dependent MDI interaction and MIT model. Our results indicate the available energy is not large enough to reach the present detectable interest. However, the results show that the available energy depends on the different bag constants and symmetry energies.

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