Contribution ID : **124** Type : **Oral talk**

The effect of tidal deformations on the gravitational wave signal during neutron star mergers

Wednesday, 23 October 2024 17:45 (15)

This work is devoted to the analysis of the influence of tidal effects on the shape of the gravitational signal from the fusion of neutron stars. The main part of the work is divided into theoretical information, analytical and numerical models, and practical implementation.

The theoretical section includes a description of the basic model for black holes and neutron stars, as well as the methods used to add tidal effects. The basic model is based on the post-Newtonian approach, which allows us to take into account the effects of interaction of compact objects without solving the Einstein equations. Within the framework of this model, a differential equation arises describing the evolution of the post-Newtonian parameter, and it is further solved in two different ways.

The practical part includes calculating the parameters of the model and solving the differential equation using maxima code.

The discussion section of the results presents a comparison of numerical and analytical solutions. It turns out that the analytical solution allows you to look a little further in time and evaluate the behavior of the system at closer distances.

The conclusion summarizes the work performed, indicating the fulfillment of the tasks set, such as the analysis of modern models, calculation of coefficients for differential equations, and comparison of the results obtained by different methods. In the future, it is planned to continue work on calculating the shape of the gravitational wave signal from merging black holes and adding tidal effects to the model for calculating the shape of gravitational waves.

Primary author(s) : KLOPOVASAPOROVSKAIA, Irina; MISHAKINA, Aleksandra (MISIS); Prof. BLINNIKOV, Sergei; BLINNIKOV, Sergei (Kurchatov institute)

Presenter(s) : KLOPOVASAPOROVSKAIA, Irina

Session Classification : Gravitation and Cosmology

Track Classification : Gravitation and cosmology