Contribution ID: **9** Type: **E-Poster Presentation**

Gravitational radiation from close binaries of supermassive black holes and massive stars

Supermassive black holes (SMBHs) at the centers of galaxies can be very powerful objects, emitting in all ranges of the electromagnetic spectrum, including the important range of gravitational waves (GW). However, there are practically no active galactic nuclei (AGNs) with close binary systems from SMBHs with precisely defined kinematic and dynamic characteristics of the components necessary to determine the parameters of GW emission. This can be attributed both to the insufficiency of multifrequency data obtained on the basis of long-term monitoring and the lack of a clear methodology for determining the main SMBH parameters. The last statement involves the creation of a special mathematical apparatus for this purpose.
The kinematic and dynamic characteristics of the components require knowledge of the models of black hole orbits, their masses, and the dynamic losses of the system. To do this, it is necessary to investigate, among other things, the physical conditions in the central regions of AGN. Therefore, multi-frequency monitoring of flux densities on individual antennas can be of paramount importance for finding the required SMBH parameters.
We propose a new method for calculating the parameters of the orbits of double supermassive black holes using only multi-frequency monitoring data in the radio band [1]. The relevance also applies to close binary (multiple) stellar systems in the Galaxy, which are also capable of emitting GW. In connection with flare phenomena in the framework of the model of close binary massive star systems (CMSSs), we consider the possibility of detecting gravitational waves from CMSSs in the regions of active star formation [2]. The possibility of detecting GWs from CMSSs was considered.
This work was funded by the RSF, project number 23-22-10032.

References:
[1] A&A 648, A27 (2021).
[2] MNRAS 496, L147–L151 (2020).

Primary authors: Dr VOLVACH, Larisa; Dr LARIONOV, Mikhail; Dr VOLVACH, Alexandr

Presenter: Dr VOLVACH, Alexandr

Session Classification: Flash Talks