Contribution ID: **121** Type: **Poster**

Gravitational Waves from Magnetized Neutron Stars in Eccentric Orbits

We investigate the influence of tidal deformability and strong magnetic fields on the generation of gravitational waves during the inspiral of binary neutron stars in eccentric orbits. Although the current number of identified neutron stars exhibiting strong magnetic fields (10^{14-15} G) remains limited, the maximum allowed magnetic fields in these stars is 10^{18} G. Neutron star binaries formed via dynamical capture could possess strong magnetic fields and sizable eccentricity at the late inspiral stage. It is thus imperative to undertake investigations on these systems and the dominant physical processes at play in them. Strong magnetic fields can govern the orbital dynamics by inducing additional tidal deformation in their companion (corrections to tidal love number), radiating some orbital energy (magnetic dipole in motion), and inducing effects of attraction/repulsion based on the relative orientation of the magnetic axes. Prior studies have investigated the individual influence of these factors on gravitational waves. However, our research takes into account the combined effects of magnetic fields, tidal deformability, and orbital eccentricity. In order to quantify these impacts, we conduct an analysis of the accumulated cycles observed in gravitational waves while also evaluating the rates at which energy is lost as a result of electromagnetic and gravitational radiation.

Email

anushka.doke@icts.res.in

Affiliation

ICTS-TIFR

Authors: Ms DOKE, Anushka (ICTS-TIFR); Dr PRASAD, R. (ICTS-TIFR); Prof. KUMAR, Prayush (ICTS-TIFR)

Presenter: Ms DOKE, Anushka (ICTS-TIFR)

Session Classification: Gravitational Waves

Track Classification: Gravitational Waves