



Contribution ID: 218

Type: **Invited talk in the parallel session**

Emergence of Intrinsic Gravitational Modes Associated with Emissions of (GR) Gravitational Waves

Wednesday, 7 July 2021 09:30 (40 minutes)

Intrinsic Gravitational Modes (IGM) involving electromagnetic field fluctuations are found that are sustained by the time-dependent tridimensional gravitational field of Black Hole binaries when their collapse is approached. These “disk-rippling” modes, emerging from a plasma disk structure surrounding a binary, have ballooning amplitude profiles in the “vertical” direction (referring to the binary angular momentum vector) and rotate mainly with a frequency of twice the binary rotation frequency within the limited region where the Newtonian gravity modulation is valid. Modes with considerably higher frequencies can be sustained by the modulated gravitational potential through the coupling of modes of this kind whose frequencies differ by twice the binary rotation frequency. Relevant mode-particle resonances [1] can provide a means to transfer energy from high to low energy populations (a process evidenced by laboratory experiments) and offer an explanation for the absence of detectable high energy radiation emission as the observed collapse of Black Hole binaries is approached. When the disk structure is immersed in a (stationary) magnetic field [1], another class of modes can emerge and extend the range of processes resulting from mode-particle resonant interactions.

[1] B.Coppi, Pl. Phys. Rep. 45, 438 (2019).

Primary author: Prof. COPPI, bruno (MIT)

Presenter: Prof. COPPI, bruno (MIT)

Session Classification: Theoretical and Observational Studies of Astrophysical Black Holes

Track Classification: Black Holes: Theory and Observations/Experiments: Theoretical and observational studies of astrophysical black holes