Contribution ID: **77** Type: **poster**

Gravitational Radiation from chirping compact stars and inspiral planets around intermediate-mass black-holes: detection degeneracy

Wednesday, 20 February 2019 17:54 (1 minute)

We show that compressible, Riemann-S type ellipsoids can emit gravitational waves (GWs) with a chirp-like structure (chirping ellipsoids, CELs). The potential detection of these type of sources with eLISA and other future space-based GW observatories can reveal previously undetected astrophysical processes in system of compact objects (e.g. the postmerger object of white dwarf binary mergers). We study the intrinsic phase-time evolution and the fourier transform, in order to demonstrate that the waveform of CELs (mass $\sim$ 1~M$_\odot$, radius $\sim 10^3$~km, polytropic equation of state with index $n \approx 3$) is almost indistinguishable from that emitted by extreme mass-ratio inspirals (EMRIs) composed of an intermediate-mass (e.g.~$10^3\ M_\odot$) black hole and a planet-like (e.g.~$10^{-4}\ M_\odot$) companion. In addition, the miss-match between the two waveforms is computed and we show that for one year of observation, they are almost indistinguishable. The detection of these EMRIs is relevant for the understanding of planetary formation and dynamics in crowded stellar systems. From reasonable astrophysical assumptions, the rate in the local Universe of CEL and EMRIs in the mass range considered here, are very similar.

Summary

Primary authors: Mr RODRIGUEZ-RUIZ, Jose Fernando (Icranet-Icra University of Rome "La sapienza"); Dr RUEDA, Jorge Armando (Icranet- Icra University of Rome "La sapienza"); Dr RUFFINI, Remo (Icranet-Icra University of Roma "La sapienza"); ZULUAGA, Jorge Ivan (University of Antioquia - Medellin, Colombia); Dr BLANCO-IGLESIAS, Jose Miguel (Universitat Politecnica de Catalunya; University of Exeter,); Dr LOREN-AGUILAR, Pablo (Universitat Politecnica de Catalunya; University of Exeter)

Presenter: Mr RODRIGUEZ-RUIZ, Jose Fernando (Icranet-Icra University of Rome "La sapienza")

Session Classification: Poster session

Track Classification: Gravitational Waves