ID de Contribution: **30** Type: **Contributed talk**

Estimating short gamma-ray burst luminosities in conjunction with gravitational wave observations

vendredi 2 juin 2017 15:05 (15 minutes)

Progenitors of short-duration gamma-ray bursts are thought to be neutron stars coalescing with their companion black hole or neutron star. These compact binary coalescing systems are one of main targets of ground-based gravitational wave observations. In this talk, we present a Bayesian framework for combining astrophysical and gravitational wave information that allows us to probe short gamma-ray burst luminosities. We show that the combined observations not only improve progenitor distance and inclination angle estimates, they also allow short gamma-ray burst luminosities to be determined without the need for host galaxy or light curve information. We characterise our approach by simulating 1000 joint detections and comparing luminosities obtained via our analysis with the ideal scenario where the distance to the short gamma-ray burst is known exactly. We show that ~90% of the simulations have uncertainties on short gamma-ray luminosity estimates that are within a factor of 2 of the ideal scenario. This implies that, in conjunction with third-generation gravitational wave detectors, this method can be used to obtain accurate luminosity estimates for the majority of the short gamma-ray burst population within a redshift of ~1.

Auteurs principaux: Dr MESSENGER, Christopher (University of Glasgow); Dr HENG, Ik Siong (University of Glasgow); Dr FAN, Xilong (Hubei University of Education)

Orateur: Dr HENG, Ik Siong (University of Glasgow)

Classification de Session: Multi-messenger