ID de Contribution: **28** Type: **COSMOLOGIE**

Cross-correlating galaxy catalogs and gravitational waves: a tomographic approach

lundi 11 octobre 2021 15:15 (15 minutes)

Unveiling the origin of the coalescing binaries detected via gravitational waves (GW) is challenging, notably if no multi-wavelength counterpart is detected. One important diagnostic tool is the coalescing binary distribution with respect to the large scale structures (LSS) of the universe, which one can quantify via the cross-correlation of galaxy catalogs with GW ones.
I will present sensitivity prospects for the search of such a cross-correlation signal, by using both existing and forthcoming galaxy catalogs and using realistic Monte Carlo simulations of GW events. The cross-correlation signal should be marginally detectable in a 10-year data taking of advanced LIGO-Virgo detectors at design sensitivity, at least for binary neutron star mergers, while the expected addition of KAGRA and LIGO-India to the GW detector network would allow for a firmer detection of this signal and, in combination with future cosmological surveys, would also permit the detection of cross-correlation for coalescing black holes. I will show how adopting a tomographic approach as well as reaching a sufficiently accurate localization of GW events will be crucial to attain rather advanced model discrimination capabilities.

Author: CALORE, Francesca (LAPTh, CNRS)

Orateur: CALORE, Francesca (LAPTh, CNRS)

Classification de Session: Groupe de Travail: COSMOLOGIE