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Cosmology with Dark Sirens : The inclusion of spins

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Since 2015, 90 gravitational waves (GW) signals, mainly produced by the merger of binary black hole (BBH), have been detected by the LIGO-Virgo-Kagra (LVK) collaboration. Beside being one of the most important discovery in physics of the 21st century, the detection of GWs is also the beginning of a new era, that opened a new window to study our universe. The LVK collaboration uses two pipelines (IcaroGW and GWcosmo) to estimate jointly the cosmological parameters (such as the Hubble constant or the density of baryonic matter) and the population parameters of the sources (mass function of BBH, redshift etc...).
The aim of this work is to generalize IcaroGW hierarchical inference by implementing BBHs spin models to the analysis. These parameters are important to take into consideration since the spin of BBHs systems could correlate with some cosmological parameters, hence have an impact on the constraints GWs put on cosmology.

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