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Constraining the features of the BBH mass distribution through population synthesis simulation

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The first direct detection of gravitational waves (GWs), back in 2015, marked the beginning of a new era for the study of compact objects, and the upcoming next-generation detectors, such as Einstein Telescope (ET), are expected to add hundreds of thousands of compact binary coalescences to the list. We discovered up to 90 GW signals, from which we were able to put some constraints on the phenomenon leading to the formation, the evolution and the eventual merger of binary systems.

However, the processes occurring during the evolution of such systems exhibit degeneracies, making it challenging to obtain individual constraints.

In this talk, I will show the result we obtained when we tried to disentangle such degeneracies, performing population synthesis simulations under various assumptions and trying to reproduce the distribution we observe from the data collected by LVK.

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