Contribution ID: **9** Type: **Oral**

Chirp mass - distance distributions of the sources of the gravitational waves

The detection of gravitational waves emitted by binary black holes raises a question of the binaries' origin. There are several models present in the literature involving binary evolution in both field and clusters. Here I aim to compare predictions of these models with the observations.
Using the Bayesian inference I compare the models with the up-to-date detections using the distributions of the observed chirp mass and luminosity distance of the source.

I present the ranking of ability to explain all current gravitational waves detections by the models. It is shown that the best models correspond to the binary evolution with low metallicity and disfavours evolutions in globular clusters. I also calculate the number of observations required to distinguish each pair of models, the answer varies from 10 to several thousand for some pairs.

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