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Title: **A LUMINOSITY DISTRIBUTION FOR KILONOVAE BASED ON SHORT GAMMA-RAY BURST AFTERGLOWS**

Abstract:

The combined detection of a gravitational-wave signal, kilonova (KN), and short gamma-ray burst (sGRB) from GW170817 marked a scientific breakthrough in the field of multi-messenger astronomy. But even before GW170817, there have been a number of sGRBs with possible associated KN detections. In this talk, I present my work that aims to constrain the KN luminosity distribution exploiting the observations of nearby sGRB with and without a possible KN associated. Fitting the sGRB afterglow lightcurves with state-of-the-art afterglow and KN models, the distributions of merger's ejecta velocity, mass and lanthanides fraction have been derived. The posteriors on KN parameters obtained in this way were turned into distributions for the peak magnitude of the KN emission in different bands and the time at which this peak occurs. From the magnitude distributions of GW170817/AT2017gfo, KN candidates GRB130603B, GRB050709 and GRB060614 (with the possible inclusion of GRB150101B, GRB050724A, GRB061201, GRB080905A, GRB150424A, GRB160821B) and the upper limits from all the other sGRBs not associated with any KN detection for the first time a KN luminosity distribution in different bands has been obtained. This could be of great advantage for astronomers in order to optimize an observation strategy devoted to the detection of these elusive transients.