Mimicking black hole mimickers

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Black holes mimickers, e.g. boson stars, are compact objects with similar properties to black holes. The gravitational wave signal emitted by a binary of such putative objects during the inspiral phase is difficult to distinguish from the one emitted by a black hole binary. Nevertheless, significant differences might appear in the post merger signal. Inspired by the known behavior of black holes, neutron stars and boson stars we propose a toy model that captures potential characteristics of such systems composed by such mimickers. This model can be exploited to assess how well such signal could be recovered with gravitational waves observations from earth based detectors using standard templates. By analyzing the residuals, i.e. the difference between the injected signal and the best fit template, one can also develop strategies to extract the new physics described by these new signals.

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