How to distinguish binary black-hole variability from single black hole

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Since the first detection of gravitational wave signals from binary black-hole, the hunt for their pre and post-merger electromagnetic counterparts has started. In particular, numerical simulations have been looking for a signal unique to binary black-hole, their ?smoking gun?, that could help identify pre-merger systems with certainty.

With several characteristic signals already put forward, we now concentrate on their uniqueness. This is especially important as a disk instability has been proposed to explain the strong timing feature associated with pre-merger binary black holes. Here we will use general-relativistic hydrodynamical and ray-tracing simulations to compute the observables associated with BBH systems and see in which cases they could be distinguished from more standard black-hole variability such as QPOs.

In particular, we will continue with a model-dependent approach for the QPOs to see if a better knowledge of QPOs would offer some distinction from a typical pre-merger BBH lightcurve.