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The reliability of the low-latency estimation of binary neutron star chirp mass[1] SALVATORE VITALE, ANDREA SYLVIA BISCOVEANU, CARL-JOHAN HASTER, Massachusetts Institute of Technology MIT — The LIGO and Virgo Collaborations currently conduct searches for gravitational waves from compact binary coalescences in real-time. For promising candidate events, a sky map and distance estimation are released in low-latency, to facilitate their electromagnetic follow-up. Currently, no information is released about the masses of the compact objects. Recently, Margalit and Metzger (2019) have suggested that knowledge of the chirp mass of the detected binary neutron stars could be useful to prioritize the electromagnetic follow-up effort, and have urged the LIGO-Virgo collaboration to release chirp mass information in low-latency. However, the low-latency searches for compact binaries make simplifying assumptions that could introduce biases in the mass parameters: neutron stars are treated as point particles with dimensionless spins below 0.05 perfectly aligned with the orbital angular momentum. Furthermore, the template bank used to search for them has a finite resolution. In this presentation we will show that none of these limitations can introduce chirp mass biases larger than $\sim 10^{-3}$ solar masses. We also quantify biases on other mass parameters.

[1]NSF

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