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Simultaneous inference of the neutron star population and equation of state[1] RICHARD O'SHAUGHNESSY, DANIEL WYSOCKI, Rochester Institute of Technology, LESLIE WADE, Kenyon College, JACOB LANGE, Rochester Institute of Technology — Observations of the properties of multiple coalescing neutron stars will simultaneously provide insight into the neutron star (NS) mass and spin distribution, the NS merger rate, and the nuclear equation of state. Gravitational wave observations demonstrate that merging compact objects arise from a diverse population. We show how to combine all information obtained from gravitational wave measurements into a joint constraint on the NS merger rate, the distribution of NS properties, and the nuclear equation of state (EOS). We illustrate the importance of joint modeling with a concrete example, illustrating how biased mass distribution inferences can significantly impact the recovered equation of state, even in the small-N limit. We discuss how to incorporate recent results into a revised constraint on the EOS.

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