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Placing Constraints on a Neutron Star Equation of State using Heirarchical Population Inference MONICA RIZZO, RICHARD O'SHAUGHNESSY, Rochester Inst of Tech — With the recent detection of gravitational waves from binary neutron stars (BNSs), it has become crucial to understand and optimize methods of recovering information from these types of events. BNS mergers convey a wealth of information, including clues as to what the nuclear equation of state (EOS) of cold high density matter might be. In order to recover information about the composition of neutron stars with minimal bias, we assume a direct relationship between their mass and tidal deformability (λ) - unique to EOSs - when estimating their parameters using Bayesian techniques. We then implement a spectral EOS parameterization method (Lindblom 2010), where each EOS is described by 4 free variables. Then, for a population of realistic BNS events, we use Bayesian hierarchical parameter estimation to recover these EOS parameters. The inferences made can potentially be used to probe fundamental physics and place bounds on a plausible nuclear EOS.

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