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Rapid Parameter Estimation of Gravitational Waves from Binary Neutron Star Coalescence using Focused Reduced Order Quadrature SOICHIRO MORISAKI, University of Wisconsin - Milwaukee, VIVIEN RAYMOND, Cardiff University — Rapid parameter estimation of gravitational waves from binary neutron star coalescence, in particular accurate sky localization in minutes after the initial detection stage, is crucial for the success of multimessenger observations. One of the techniques to speed up the parameter estimation, which has been applied for the production analysis of the LIGO-Virgo collaboration, is reduced order quadrature (ROQ). While it speeds up parameter estimation significantly, the time required is still on the order of hours. Focusing on the fact that the parameter-estimation follow-up can be tuned with the information available at the detection stage, we improve the ROQ technique and develop a new technique, which we designate focused reduced order quadrature (FROQ). We find that FROQ speeds up the parameter estimation by a factor of $O(10^3)$ to $O(10^4)$ and enables providing accurate source properties such as the location of a source in several tens of minutes after detection. In this talk, we introduce the FROQ technique and show its performance.

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