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The BayesWave Algorithm for Detecting and Characterizing Gravitational Wave Burst Signals NEIL CORNISH, PAUL BAKER, Montana State University, TYSON LITTENBERG, NASA, GSFC — With a network of gravitational wave detectors it is possible to distinguish between instrumental artifacts, or glitches, and un-modeled gravitational wave signals. The LIGO-Virgo Burst group has developed several effective algorithms for detecting un-modeled, short duration burst signals such as might be generated by core collapse supernovae or associated with gamma ray burst. Here we present a new algorithm, “BayesWave” that uses Bayesian model selection to decide if features in the data are better described as gravitational wave signals or instrument glitches, and MCMC posterior reconstruction to characterize the physical content of the signal. As a by-product, this procedure produces cleaned data streams that are free of loud glitches. The cleaned data can then be used by standard template based searches for modeled signals such as binary inspirals, but now with significantly reduced backgrounds, making it possible to detect weaker signals.

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