Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Detection and waveform reconstruction of gravitational-wave signals with coherent Wave Burst and Wavelet Detection Filter methods. YANYAN ZHENG, Missouri University of Science Technology, ALBERTO LESS, Universit di Roma Tor Vergata, FILIP MORAWSKI, Nicolaus Copernicus Astronomical Center, MARCO CAVAGLIA, Missouri University of Science Technology, ELENA CUOCO, European Gravitational Observatory — The coherent-Wave Burst (cWB) and the Wavelet Detection Filter (WDF) pipelines are wavelet-based software tools designed for the detection and reconstruction of unmodelled, transient gravitational-wave signals for a network of gravitational-wave detectors. cWB is one of the main pipelines in use by the LIGO Scientific and Virgo collaborations to search for unmodelled signals. WDF is an event trigger generator that is designed to incorporate machine learning. We compare the detection efficiency of the two pipelines by injecting binary black hole signals in Advanced detector recolored noise. We find that the efficiency of the pipelines is comparable for signals with signal-to-noise ratio above ˜10. We perform a statistical comparison of the signal waveforms that are reconstructed by the pipelines. Both cWB and WDF provide comparable reconstructed waveforms that are consistent with the injected signals.

Yanyan Zheng
Missouri University of Science
Technology

Date submitted: 08 Jan 2021 Electronic form version 1.4