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Development of a Burst Gravitational Wave Detectable Range Visualization[1] DOMINIC HOLCOMB, Villanova University, JAMES TERHUNE, University of California, Los Angeles, AMBER STUVER, Villanova University, LIGO COLLABORATION — The Laser Interferometer Gravitational-wave Observatory (LIGO) measures gravitational waves of astrophysical origin. A common measure of detector performance used by LIGO is the distance to which a standard binary neutron star merger can be detected. While all the detected gravitational waves to date have been of this kind, it is expected that the next class of detected gravitational waves will be from unmodelled or unanticipated sources, also known as "bursts." This research focuses on developing a measure of the detectable distance for a burst gravitational wave that is sensitive to the near-real time data quality of the detector. We have developed software that collects results from the primary burst search algorithm to determine what signal-to-noise ratio is needed to achieve an acceptable false-alarm rate and combines this with the power spectral density of the noise to calculate the detectable distance for a standard burst source. The result can be visualized as a time-frequency representation or an average distance over the sensitive frequency range. Ultimately, this measure will be automatically generated during the next observing run and used to determine the effect of current data quality on the search for burst gravitational waves.

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Dominic Holcomb
Villanova University

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