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The impact of calibration uncertainty on supernova searches and parameter estimation

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Calibration of gravitational wave detectors is an intricate and critical process, with amplitude and phase uncertainties typically at the percent level. These calibration uncertainties, which vary with frequency, are routinely incorporated into compact binary coalescence parameter estimation. However, their influence on burst searches and supernova parameter estimation is less explored. In this presentation, we introduce a method designed to apply physically motivated calibration errors on injected signals in the Coherent WaveBurst pipeline. This tool enables systematic studies of how calibration errors affect both detection efficiency and the detection statistics. Using the calibration envelopes for SN 2023ixf, we show that the impact on the detection efficiency is less than 2%. For parameter estimation, we present a preliminary investigation of the impact on core-bounce signals from rapidly rotating progenitors. Using the fitting factor as a proxy for waveform distinguishability, we quantify the extent to which calibration uncertainties may become a limiting factor in identifying source properties.

Primary authors: WILS, Milan (KU Leuven); SZCZEPANCZYK, Marek (University of Warsaw); ZANOLIN, Michele (Embry-Riddle Aeronautical University, Prescott)

Presenter: WILS, Milan (KU Leuven)

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