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Distributional Tests for the Laser Interferometer Gravitational-Wave Observatory Detections SOPHIA SCHWALBE, MAREK SZCZEPANCZYK, MICHELE ZANOLIN, Embry-Riddle Aeronautical University — The Laser Interferometer Gravitational-Wave Observatory (LIGO) advanced-generation detectors started operation in September 2015, heralding the extraordinary discovery of gravitational waves from merging black holes. This detection has opened an era for a new type of astronomy based on hearing the universe, and core-collapse supernovae are one of the most interesting sources to examine. Since the expected signal emitted by supernovae is weak, distributional tests are important tools to analyze the data to determine the existence of evidence of a gravitational wave signal by comparing distributions of background noise triggers and foreground event triggers. To do this, we use nonparametric tests that assume no particular shape of the distributions. Such non-parametric tests include the Kolmogorov-Smirnov, Mann-Whitney, chi squared, and asymmetric chi squared.

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