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Observing Gravitational Waves from the Next Nearby Core-Collapse Supernova[1] SARAH GOSSAN, CHRISTIAN OTT, Caltech, PETER KALMUS, LIGO Caltech, PATRICK SUTTON, Cardiff University, MICHELE ZANOLIN, Embry-Riddle University, PHILIPP MOESTA, Caltech, NUTSINEE KIJBUNCHOO, Louisiana State University, AMBER STUVER, LIGO Livingston Observatory — The next galactic core-collapse supernova (CCSN) has already exploded, and its electromagnetic (EM) waves, neutrinos, and gravitational waves (GWs) may arrive at any moment. We present an extensive study on prospective detection scenarios for GWs from CCSNe in the Milky Way, Large Magellanic Cloud, NGC 6822, M31, and M82. We make statements on the detectibility of astrophysically-motivated signals (including waveforms from state-of-the-art 3D CCSN simulations). We utilize real GW detector data, recolored to the predicted noise power spectral densities of the Advanced LIGO (aLIGO) and Advanced Virgo (AdVirgo) detectors at early (∼2015–2017) and late (∼2018–2020) times. We consider various uncertainties in the GW arrival time to investigate sensitivity improvements when arrival time information is provided by neutrino or EM information.

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