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Post-merger gravitational wave searches using the Cross-Correlation Algorithm TANAZZA KHANAM, ALESSANDRA CORSI, Texas Tech Univ, ROB COYNE, University of Rhode Island, ERIC SOWELL, Texas Tech Univ — After the multi-messenger detection of the binary neutron star merger GW170817, associated with gamma-ray burst (GRB) 170817a, one big open question left is the nature of the compact remnant which acts as a central engine for the GRB. In the context of cosmological GRBs, it has been suggested that X-ray afterglows showing light-curve plateaus at timescales of order 10^2-10^4 s since the GRB/merger could harbor a long-lived central engine, such as a long-lived highly magnetized NS (magnetar). Newly born magnetars have also been proposed as potential gravitational wave (GW) sources. Motivated by these considerations, we present first results from a new GW data analysis method (the Cross Correlation Algorithm-CoCoA) targeting long-lived GWs from magnetars formed in binary NS mergers associated with GRBs. We show how our search method improves substantially on previously published results for post-merger GW searches in GW170817, but requires a more restrictive hypothesis on the GW signal properties. We conclude by discussing the prospects for these types of searches in future runs of the LIGO detectors.

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