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Searching for Gamma- and hard X-ray Counterparts to Gravitational-wave events in GWTC-3 with Fermi-GBM and Swift-BAT

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The era of multi-messenger astronomy began with the gravitational-wave detection of the binary neutron-star merger, GW170817, in coincidence with a short gamma-ray burst, GRB 170817A. One of its primary goals is a detection of another coincidence of gravitational and electromagnetic emission. With that in mind, we present a follow-up search for excess emission of gamma-rays with the Fermi Gamma-ray Burst Monitor (Fermi-GBM), and that of hard X-rays with the Swift Burst Alert Telescope (Swift-BAT), in spatial and temporal correspondence to gravitational-wave events reported by LIGO/Virgo/Kagra (LVK) Collaboration. We utilize Fermi-GBM on-board triggers and sub-threshold searches in combination with Swift-BAT rate data to determine whether there is any statistically significant excess emission around the given gravitational-wave trigger. We report no new joint detections to date; however, we place joint flux upper-limits, allowing us to constrain the current theoretical models that describe the production of gamma- and X-rays in these environments.

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