

Counter-jet emissions from short gamma-ray bursts similar to a binary neutron star merger event GW 170817/GRB 170817A

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The counter jet of a short gamma-ray burst (sGRB) has not yet been observed, while recent discoveries of gravitational waves (GWs) from a binary neutron star merger GW170817 and the associated sGRB 170817A have indicated that off-axis sGRB jets are detectable. We calculate the prompt emission from the counter jet of an sGRB and show that it is typically 23–26 mag in the optical–infrared band 10–1000 seconds after the GWs for an sGRB 170817A-like event, which is brighter than the early macronova (or kilonova) emission and detectable by LSST in the near future. To scrutinize the counter jets, space GW detectors like DECIGO are powerful in forecasting the merger time (<1 s) and position (<1 arcmin) (\sim a week) before the merger.

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