

Searching for very-high-energy electromagnetic counterparts to gravitational-wave events with the Cherenkov Telescope Array

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The detection of electromagnetic (EM) emission following the gravitational wave (GW) event GW170817 opened the era of multi-messenger astronomy with GWs and provided the first direct evidence that at least a fraction of binary neutron star (BNS) mergers are progenitors of short Gamma-Ray Bursts (GRBs). GRBs are also expected to emit very-high energy (VHE, > 100 GeV) photons, as proven by the recent MAGIC and H.E.S.S. observations and one of the challenges for future multi-messenger observations will be the detection of such VHE emission from GRBs in association with GWs. In the next years, the Cherenkov Telescope Array (CTA) will be a key instrument for the EM follow-up of GW events in the VHE range, owing to its unprecedented sensitivity, rapid response and capability to monitor a large sky area via scan-mode operation. We present the CTA GW follow-up program, with a focus on the searches for short GRBs possibly associated with BNS mergers. We investigate the possible observational strategies and we outline the prospects for joint GW and VHE EM detection rates.

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Gravitational Waves; BNS mergers; Gamma-ray Bursts

Collaboration

CTA

other Collaboration

Subcategory

Theoretical Results

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