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GW follow-up in the VHE domain with H.E.S.S.

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Since the first detection of Gravitational-Wave (GW) events in 2015, scientists have been searching for their multimessenger counterparts. Major facilities are taking part in these searches by following up GW events upon their detection. In 2017, the first and only confirmed electromagnetic counterpart to a GW event was found coincident with the neutron star merger GW170817. The High Energy Stereoscopic System (H.E.S.S.) is a ground-based experiment dedicated to the observation of very high energy (VHE) gamma rays. Since 2015, H.E.S.S. has been actively taking part in the global search for the counterparts of GW events by following up the most promising GW events. In this contribution we report on the H.E.S.S. GW follow-up observations, the analysis results and the derived prospects. Although no VHE counterparts have been detected, H.E.S.S. is the first instrument to constrain the short-term and long-term VHE emission from neutron star mergers by observing GW170817. These observations allow us to place lower limits on the magnetic field in the remnants of the coalescence. The H.E.S.S. observations also place the first constraints on the VHE emission from four binary black hole mergers. The increased rate of GW event detection foreseen for the upcoming runs will increase the ability of H.E.S.S. to observe GW events across various timescales after the detection and place even stronger limits on the VHE emission of such events.

Collaboration name

H.E.S.S. Collaboration

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