

# H.E.S.S. follow-up of BBH merger events

*Tuesday 20 July 2021 18:00 (12 minutes)*

Binary black hole (BBH) mergers are not obviously expected to emit electromagnetic radiation. However, hints of a short gamma-ray burst (GRB), temporally coincident with the GW150914 BBH merger event, sparked much interest and controversy, and inspired new models to explain a potential relation between BBH mergers and GRBs. To put these models to the test BBH follow-up observations across the full electromagnetic spectrum remain therefore interesting. BBH follow-up also are helpful for defining and improving GW follow-up strategies and analysis procedures. We present here, follow-up observations of four BBH events performed with the High Energy Stereoscopic System (H.E.S.S.) in the very-high-energy (VHE) gamma-ray domain during the second and third LIGO/Virgo observation runs. Detailed analyses of the obtained data did not show significant VHE emission. We derive integral upper limit maps considering a generic  $E^{-2}$  source spectrum in the most sensitive H.E.S.S. energy interval ranging from 1 to 10 TeV. We also consider EBL absorption effects and derive integral upper limits over the full accessible energy range. We finally derive upper limits of the VHE luminosity for each event and compare them with the expected VHE emission from GRBs.

## Keywords

Gravitational Waves, VHE gamma-rays, H.E.S.S., BBH

## Collaboration

H.E.S.S.

## other Collaboration

## Subcategory

Experimental Results

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**Session Classification:** Discussion

**Track Classification:** Scientific Field: MM | Multi-Messenger