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Fifteen years of Gamma-Ray Burst observations at very high energies with H.E.S.S.

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We present results from the High Energy Stereoscopic System (H.E.S.S.) follow-up observations of Gamma-ray Bursts (GRBs) between 2004 and 2019. We are focusing on non-detections and providing the most extensive set of very-high-energy (VHE, >100 GeV) upper limits to date. We use this catalogue to constrain the properties of VHE-detected GRBs and compare them to those detected at VHE. Our study finds that VHE-detected GRBs are not a distinct population but are instead associated with bright X-ray afterglows and low redshifts. In addition, we model the multi-wavelength emission of a few of the observed GRBs and discuss the results in the context of their obtained microphysical parameters. The results from this work help put current VHE observations into perspective and highlight the promising capabilities of next-generation instruments, such as the Cherenkov Telescope Array Observatory (CTAO), in detecting fainter and more distant GRBs at VHE.

Collaboration(s)

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