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The MAGIC view of gamma-ray bursts at very high energies

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After almost two decades of searches, in January 2019, MAGIC unambiguously detected TeV emission from the gamma-ray burst GRB 190114C. This long-awaited detection marked the beginning of the very high energy (VHE, $E > 100$ GeV) era for GRB studies. After this historical achievement, the MAGIC collaboration continued its effort in the follow-up of GRBs. In December 2020, MAGIC detected GRB 201216C, a long GRB at redshift $z = 1.1$, and got a strong hint of detection for GRB 201015A, a relatively low luminosity GRB. Together with the evidence of emission from the short GRB 160821B, these results confirm MAGIC as one of the best instruments for studying GRBs in the VHE range. They also lead to interesting questions about the universality of TeV emission in different (sub-)classes of GRBs, or the modeling of such emission in a unified theoretical scenario. In this contribution, we will present the status of the MAGIC GRB follow-up program. In particular, we will focus on the physical implications of GRB results at VHE and the open questions for which more detected GRBs are needed. Finally, we will give some prospects for future GRB studies with MAGIC, showing how this instrument will contribute even more to this new exciting branch of GRB physics.

Collaboration name

MAGIC

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