

Very-high-energy gamma-ray emission from GRB 201216C detected by MAGIC

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What is this contribution about?

This contribution reports the detection of very-high-energy (VHE, > 50 GeV) gamma rays from GRB 201216C by the MAGIC telescopes.

Why is it relevant / interesting?

So far there are only 3 GRBs that have been detected at the VHE range. Detection of more GRBs is crucial to constrain the VHE emission processes.

GRB 201216C is a long-duration bright GRB, and the 4th GRB detected at the VHE range. Its redshift is $z=1.1$, which makes it the most distant GRB, and the most distant VHE-emitting source, ever detected. The detailed study on this GRB could provide new insight into general features of the VHE emission from GRBs.

What have we done?

We performed a detailed analysis of the MAGIC data of GRB 201216C. We produced the so-called theta square plot and the skymap to calculate the significance of the emission, and calculated the GRB spectrum and its photon flux light curve to argue the emission process.

What is the result?

We obtained a detection with a significance of 6 sigma from the theta square plot and the skymap. The observed spectrum for the same period shows a very steep slope due to the attenuation by the extragalactic background light (EBL). The EBL-corrected spectrum shows a much flatter spectrum and is consistent with a single power-law function. The photon flux light curve is consistent with a single power-law function from the beginning of the MAGIC observation at 56 seconds after the trigger time by *Swift*-BAT for at least 20 minutes.