

Observation of a relatively low luminosity long duration GRB 201015A by the MAGIC telescopes

Friday 16 July 2021 19:18 (12 minutes)

Starting from the first unequivocal detection of very high energy (VHE) emission from the luminous gamma-ray burst (GRB) GRB 190114C by the MAGIC telescopes, four detections of VHE emission from GRBs by ground-based telescopes were reported as of today. Such new energetic components were missing for a long time and these observations have become a new probe to explore GRB physics. In order to deepen our understanding, more GRB observations by VHE instruments are crucial. GRB 201015A was detected by the Swift/BAT and the duration of its prompt emission was measured as 9.78 ± 3.47 seconds. We started fast follow-up observations of this GRB with the MAGIC telescopes about 30 seconds after its onset under good observational conditions. Subsequent optical observations measured the redshift of the host galaxy as 0.42 and found the associated type Ic-BL supernova. The total isotropic equivalent energy of the prompt emission is then estimated to be the order of 10^{50} erg, which means this is a long GRB with a relatively low luminosity. In this sense, GRB 201015A may have similar properties to GRB 190829A whose VHE emission was detected by the H.E.S.S. telescopes. The accurate analysis of the MAGIC data confirms the strong hint of detection, implying a significant energy release in the TeV range, comparable with that of the prompt emission in the keV-MeV band. We report these results and theoretical interpretation of GRB 201015A emission.

Keywords

GRB; very high energy emission; MAGIC

Collaboration

MAGIC

other Collaboration

Subcategory

Experimental Results

Authors: SUDA, Yusuke; ARTERO, Manuel; ASANO, Katsuaki (ICRR); BERTI, Alessio (INFN); NAVA, Lara; NODA, Koji (Institute for Cosmic Ray Research, The University of Tokyo); TERAUCHI, Kenta; FOR THE MAGIC COLLABORATION

Presenter: SUDA, Yusuke

Session Classification: Discussion

Track Classification: Scientific Field: GAI | Gamma Ray Indirect