MAGIC observation of a short nearby GRB 160821B

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Gamma-ray bursts (GRBs) are the most luminous explosions in the Universe, yet many of their basic properties remain poorly understood, particularly for short GRBs with durations less than ~ 2 sec. Fermi/LAT has shown that some GRBs emit at high-energy (100 MeV to ~ 100 GeV) gamma-rays with a hard (index of < 2) spectrum. Atmospheric Cherenkov Telescopes (IACTs) could provide information on the possible emission at very-high-energy (VHE, > 100 GeV) gamma-rays. In particular MAGIC telescopes were designed to explore this particular physics case. Although no firm detection has been reported so far, the MAGIC Collaboration reported a hint of a VHE gamma-ray emissions from a short, very nearby ($z = 0.16$) GRB 160821B. Even if it is only a hint, this creates doubts on the the standard expectations for gamma-ray emissions from GRBs: low energy (~ 30 GeV) over a short period (< 100 s). Moreover GRB 160821B showed a clear extended emission in the X-ray band, which can be generated by a ms pulsar after a NS-NS or NS-BH merger. In this picture a long activity with multiple Lorenz factors is well expected, which can consistently explain a possible long VHE emission. In this contribution we will briefly report on the hint of the signal and on possible interpretations of the data assuming that the hint is real.

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