

## MAGIC results and multi-wavelength observations of a Mrk 501 flare in June 2012

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**Abstract:** The blazar Mrk 501 is one of the closest and brightest extragalactic sources identified as very high energy ( $> 100$  GeV, VHE) gamma-ray emitter. Since 2009, Mrk 501 is regularly observed with the MAGIC telescopes in the framework of extensive multi-wavelength campaigns. The campaign performed in 2012 involved more than 25 different instruments which provided an excellent temporal and broadband coverage of the source. On the 2012 June 9<sup>th</sup>, during a high activity period of Mrk 501 observed at VHE with MAGIC, we detected an exceptional TeV flare  $\sim 5$  times the Crab nebula flux at energies above 1 TeV, together with a particularly hard observed spectrum in the MAGIC energy range. A comparable high flux level for this source was detected only during the historical flare from 1997, which was characterized with the previous generation of Cherenkov Telescopes (HEGRA/CAT/Whipple). The MAGIC results from the observations carried on in May-June 2012, combined with detailed simultaneous broadband observations, provide a unique dataset to probe the intrinsic properties of the source and constrain the theoretical models for blazar emission.

**Keywords:** Mrk 501, gamma-ray, blazar, flare, MAGIC.