



Contribution ID: 309

Type: Oral contribution

## MAGIC observations of the February 2014 flare of 1ES 1011+496 and measurement of the Extragalactic Background Light density

*Wednesday 5 August 2015 11:15 (15 minutes)*

1ES 1011+496 is a blazar located at a redshift  $z=0.212$ , revealed as a very-high-energy gamma-ray emitter by MAGIC in 2007. In February 2014 the source underwent an unprecedented flaring episode. Following a flare alert issued by VERITAS, the MAGIC telescopes carried out an observation campaign for a total of 17 nights between February 6 and March 7, during which the source reached a peak flux of almost 14 times the flux measured by MAGIC at the time of discovery, before returning to its low state. Despite the large flux variations, the estimated intrinsic spectral shape was remarkably stable through the whole period. The average spectrum during the flare could be well measured up to a few TeV, which makes it an ideal observation for probing the Extragalactic Background Light (EBL) through its effects on the gamma-ray flux. We implemented a method similar to the one used recently in high- and very-high-energy gamma-ray astronomy for this purpose, consisting in a likelihood maximization in which both the intrinsic spectral parameters of the source and the EBL density are free parameters. With this method we computed limits on the EBL density using as a template Dominguez et al. (2011) model with an additional scaling parameter. This measurement is among the most constraining ones obtained with gamma-ray telescopes on a single source and strengthens the case for no significant contribution of unresolved sources to the EBL.

### Collaboration

MAGIC

### Registration number following "ICRC2015-I/"

470

**Author:** GONZALEZ MUÑOZ, Adiv (IFAE)

**Co-authors:** Dr MORALEJO, Abelardo (IFAE); Dr MAZIN, Daniel (ICRR,U-Tokyo); VOVK, Ievgen (urn:Google); BANGALE, Priyadarshini (Max planck Institute for physics)

**Presenter:** BANGALE, Priyadarshini (Max planck Institute for physics)

**Session Classification:** Parallel GA18 EGAL

**Track Classification:** GA-EX