

VHE gamma-rays from S50716+714 during its brightest outburst

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S5 0716+714 is a well known BL-Lac object, characterized by an extreme variability across the whole electromagnetic spectrum. The discovery in the Very High Energy band (VHE, $E > 100$ GeV) by MAGIC happened in 2008, but at that time Fermi-LAT data were not yet available. During January 2015 the source went through the brightest optical state ever observed, triggering MAGIC follow-up observations, which resulted in a VHE detection with ~ 13 sigma significance (ATel #6999). The data, combined with simultaneous Fermi-LAT observations in the High Energy (HE, $100 \text{ MeV} < HE < 100 \text{ GeV}$) regime allow to constrain the inverse Compton peak of the spectrum. Moreover, the presence of simultaneous data from MAGIC in the VHE gamma-ray range and Fermi-LAT in the HE band will lead to a more precise estimation of the redshift. Rich multiwavelength coverage of the impressive high state allowed us to study the broad-band spectral energy distribution of S50716+714 during its brightest outburst. We present the preliminary analysis of MAGIC and Fermi-LAT data of the flaring activity in January and February 2015 for the HE and VHE band, together with radio (Metsahovi, OVRO, VLBA, Effelsberg), sub-millimeter (SMA), optical (Tuorla, Perkins, Steward, AZT-8+ST7, LX-200, Kanata), X-ray and UV (Swift-XRT and UVOT), in the same time-window. We also report on a preliminary study on the Extragalactic Background Light absorption with implications on current EBL models and on the redshift determination.

Summary

S5 0716+714 is a well known BL-Lac object, characterized by an extreme variability across the whole electromagnetic spectrum. It was discovered by MAGIC in 2008, when Fermi-data were not yet available. In Jan 2015 an extreme outburst in all the wavelengths, from radio to VHE, allowed us to deeply study the source and investigate its variable nature taking advantage of the rich multi-wavelength coverage.

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