



Contribution ID: 541

Type: **Poster contribution**

Long term variability study for the radio galaxy M87 with MAGIC

Thursday, July 30, 2015 3:30 PM (1 hour)

M 87 is the closest extragalactic VHE object located in the Virgo cluster of galaxies at a distance of ~ 16 Mpc (redshift $z=0.00436$). It is the first and brightest radio galaxy detected in the TeV regime, well studied from radio to X-ray energies. The structure of its relativistic plasma jet, which is misaligned with respect to our line of sight, is spatially resolved in X-ray (Chandra), optical and radio (VLA/VLBA) observations. Thus the time correlation between the TeV flux and emission at different wavelengths provides a unique opportunity to localize the VHE emission process occurring in active galaxy nuclei. In 2005, gamma-ray emission at TeV energies was detected for the first time in M87. The very high energy (VHE, $E > 100$ GeV) gamma-ray emission displays strong flux variability on timescales as short as a day. For more than 10 years, along with X-ray, optical and radio bands, it has been monitored in the TeV band by imaging atmosphere Cherenkov telescopes such as MAGIC, HESS and VERITAS. In 2008 and 2010, M87 underwent several periods of TeV activities, and rapid flares with short timescale variability were detected. MAGIC continued to monitor M87 but no major flares were detected since 2010. However, the monitoring data set allows us to study the source in quiescent flux state. Here we present the status of these studies using the data from the last 4 years of MAGIC observations.

Collaboration

MAGIC

Registration number following "ICRC2015-I"

470

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