

Mrk 501 MWL campaign 2008

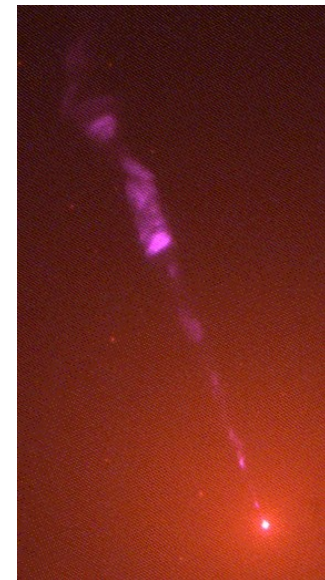
Magic Results



EVO telcon, 10.09.2008

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The Magic telescope



Major Atmospheric Gamma Imaging Cerenkov Telescope

located at the Roque de los Muchachos on the Canary Island La Palma, Spain, at 2225 m above sea level

Largest Imaging Air Cerenkov Telescope for γ -ray Astronomy

Design optimized for:

- low energy threshold $E_{\gamma} \sim 50$ GeV to explore the energy gap between space-borne and ground based experiments
- fast repositioning in less than 30 seconds (GRBs)
- sensitivity 1.6% Crab/50h/5 σ $E > 270$ GeV

Start of construction in 2001

Inauguration in October 2003

Start of regular data taking in September 2004

Start of Magic-II operation End of 2008

MAGIC Collaboration: more than 150 physicists from 18 institutes and 11 countries.

The Data

The observations have been performed between March 29th and May 13th 2008.

Zenith angle: 10 – 30 deg

Observation mode: ON/OFF

Observation conditions: dark (22.7 h) & moderate moonlight (8.7 h)

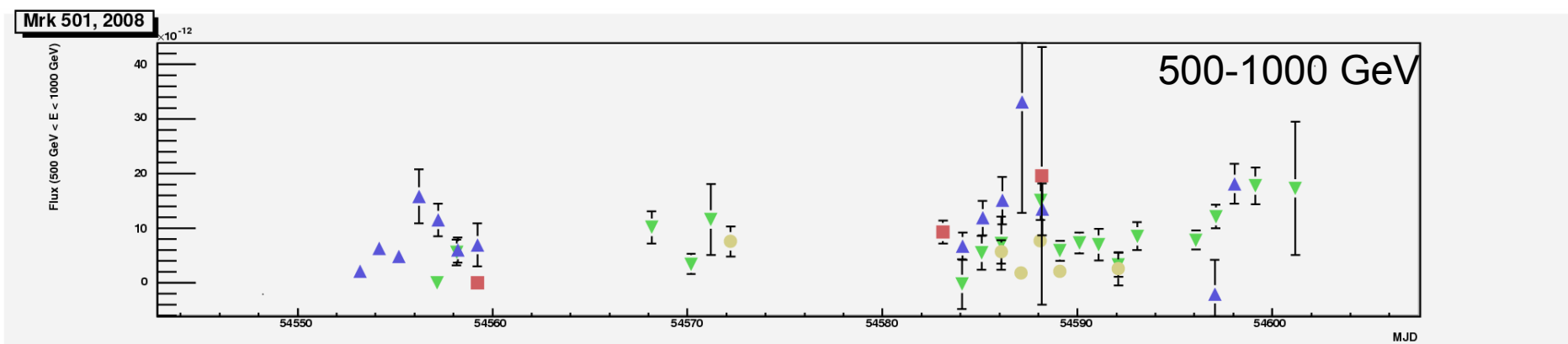
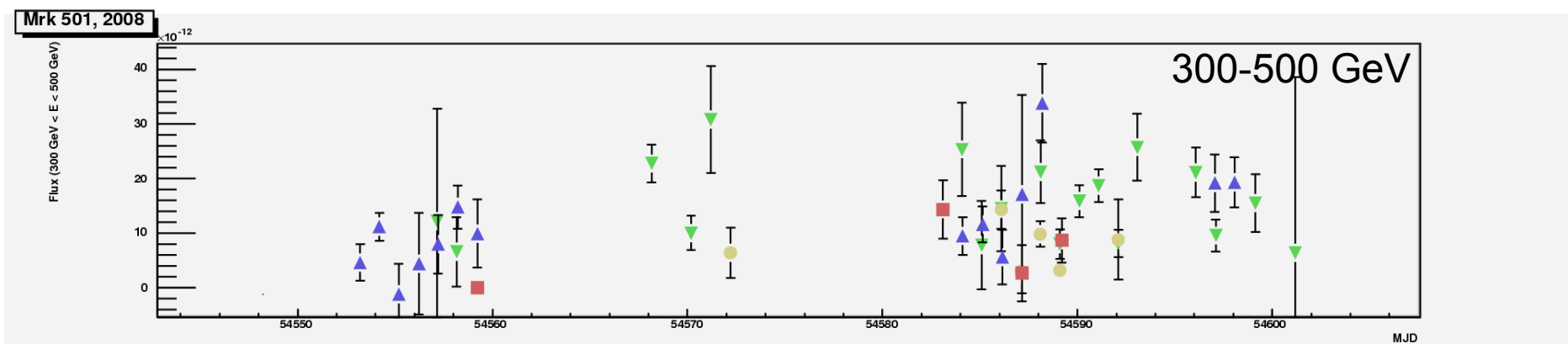
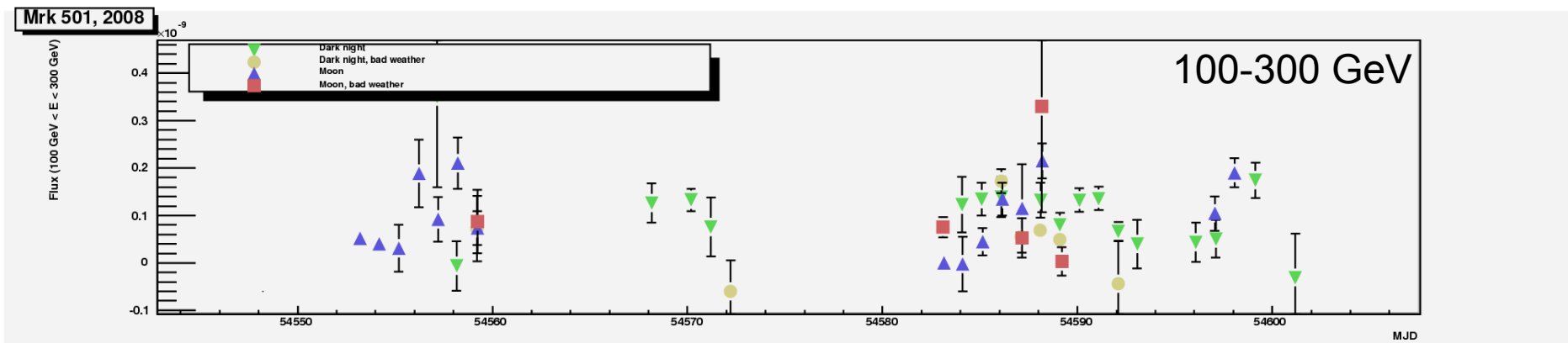
Standard analysis chain – MARS (Magic Analysis and Reconstruction Software)

Data processing: calibration, Hillas parametrisation of images (time image cleaning)

Gamma-hadron separation & energy estimation using Random Forest method

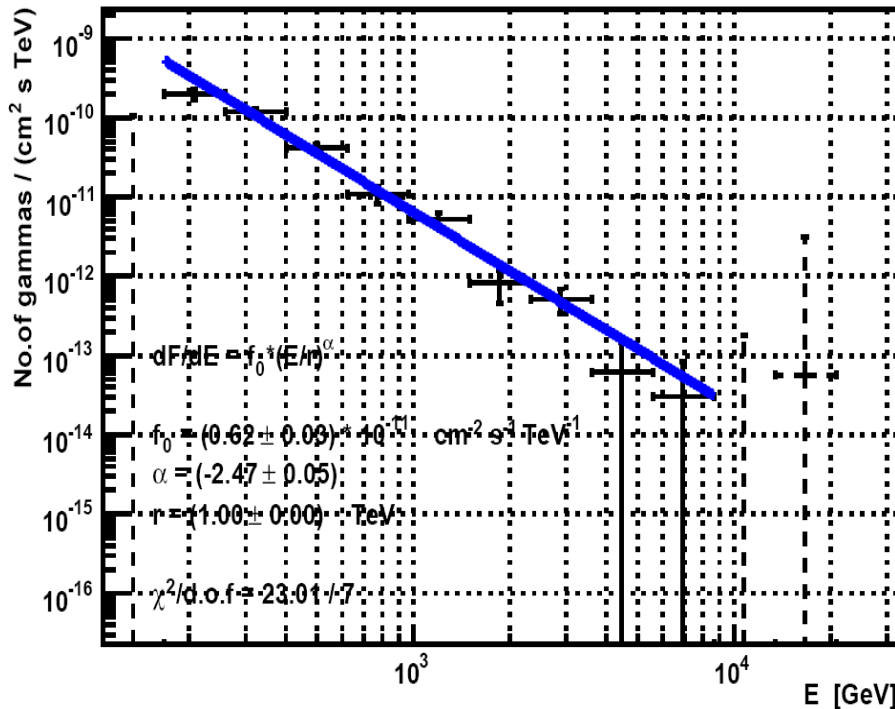
Spectra: unfolded (3 different methods)

Lightcurves



Energy spectra

Result of correlated fit for dN/dE

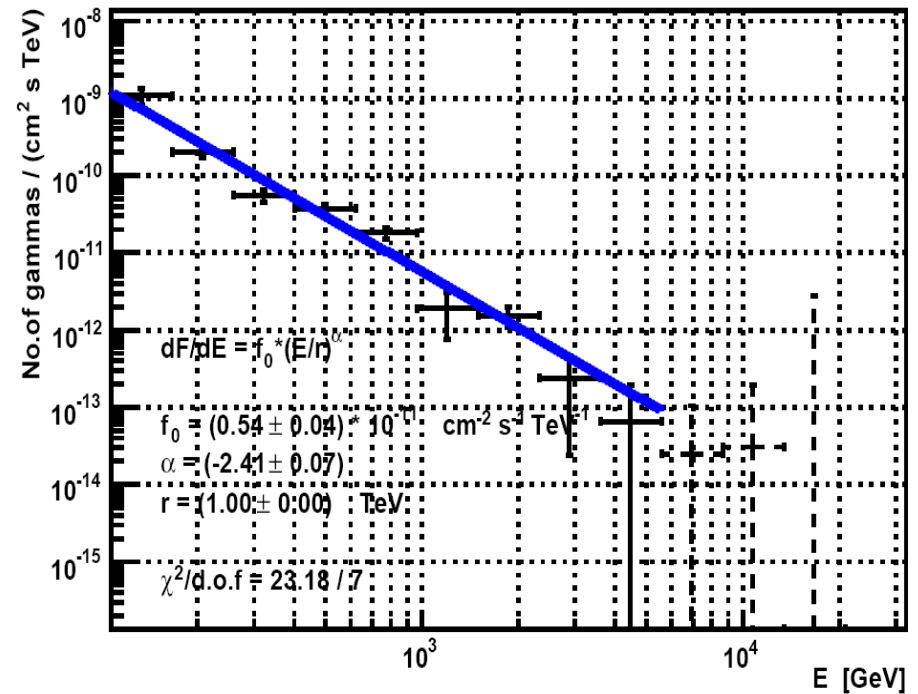


Dark night: $\alpha = -2.47 \pm 0.05$

$f_0 = 0.63 \pm 0.03 \times 10^{-11} \text{ cm}^{-2} \text{ s}^{-1} \text{ TeV}^{-1}$

$\chi^2/\text{d.o.f} = 23.0/7$

Result of correlated fit for dN/dE



Moon: $\alpha = -2.41 \pm 0.07$

$f_0 = 0.54 \pm 0.04 \times 10^{-11} \text{ cm}^{-2} \text{ s}^{-1} \text{ TeV}^{-1}$

$\chi^2/\text{d.o.f} = 23.2/7$

Good agreement between dark night & moon spectra. Large χ^2 hints towards a presence of cutoff (under investigation)

Summary & Outlook

- ~30 h of dark and moon data analysed
- average flux level ~ 30-40% Crab
- no obvious flares

Under investigation:

- cutoff in spectra
- spectral index changes (correlation with high X-ray state)
- variability