



# FACT - the First G-APD Cherenkov Telescope

## Multi-Wavelength View on TeV Blazars

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### First G-APD Cherenkov Telescope



Photo: P. Vogler

#### Major Goals:

- Longterm monitoring of bright TeV blazars
- Proof of principle for the use of G-APDs\* (aka SiPM) in Cherenkov astronomy

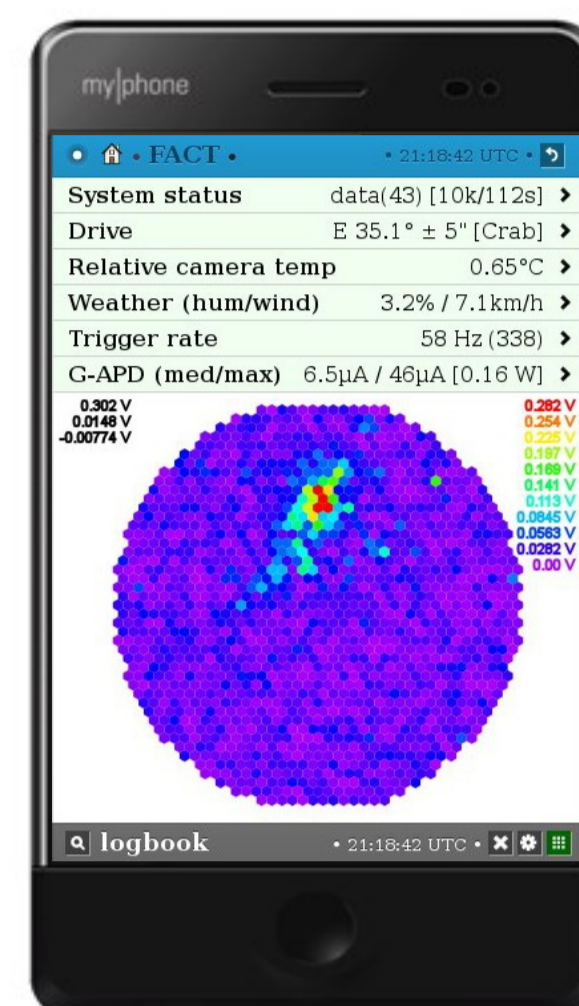
#### Facts about FACT

- Operation since October 2011
- Using Imaging Atmospheric Cherenkov Technique (IACT)
- Site: Observatorio Roque de los Muchachos, La Palma, Spain (2200 m a.s.l.)
- 9.5 m<sup>2</sup> mirror surface
- 4.5° field of view
- 1440 pixels (0.11° FoV each)
- Remote and automatic operation
- More details in [1] and [2]

### Ideal for Longterm Monitoring

G-APDs\* robust and stable, no aging effects due to bright light

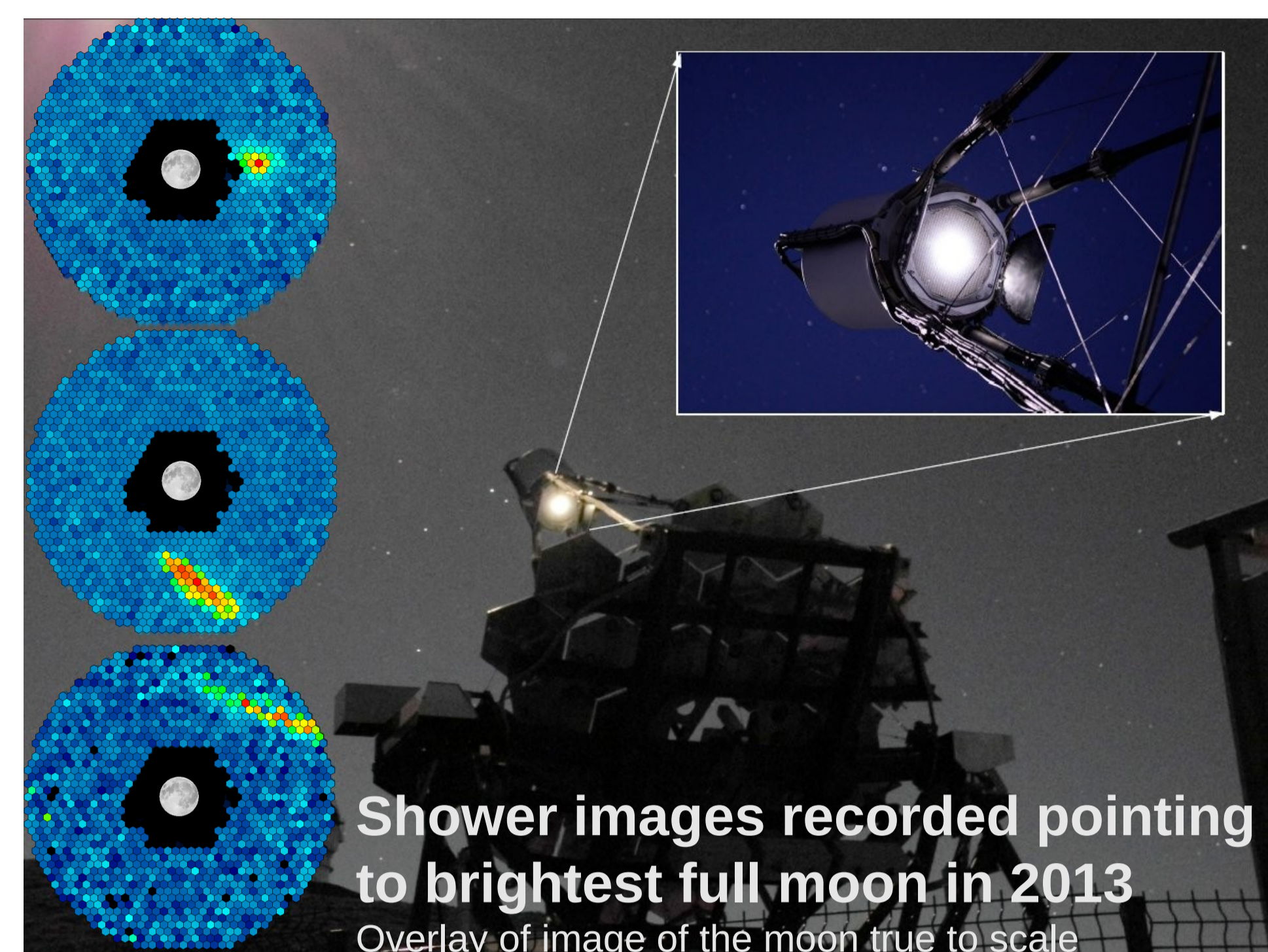
- Observations during strong moon
- Stable detector performance



Automatic and remote Operation [4]:

- Stable and consistent data taking, high data taking efficiency

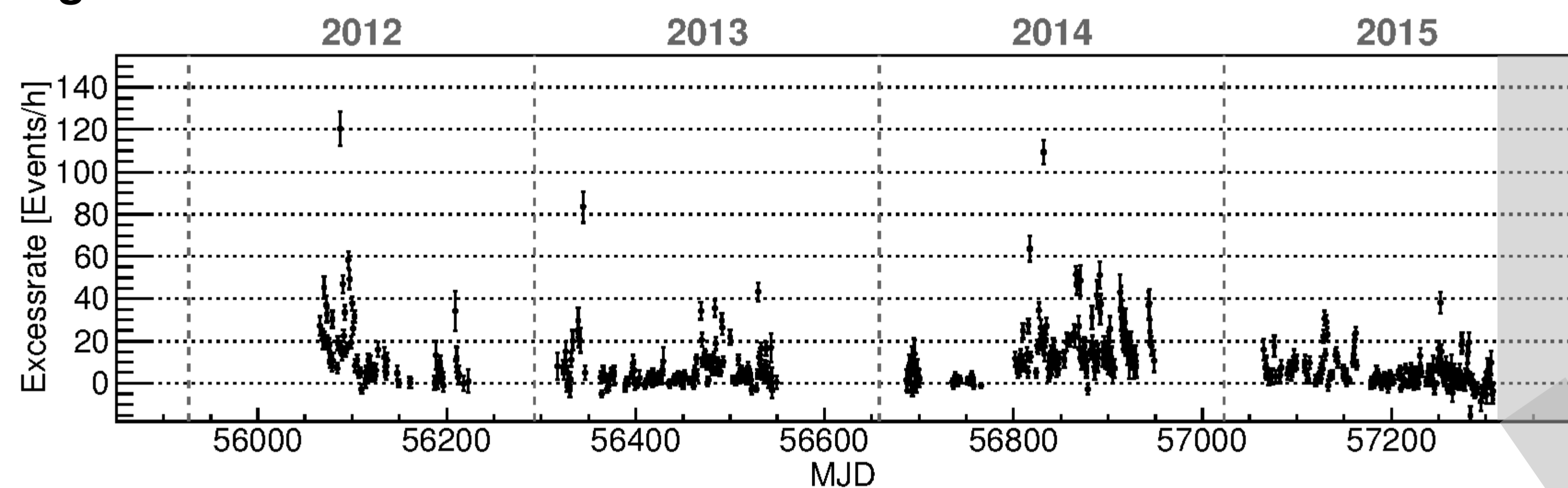
<http://www.fact-project.org/smartfact>



Photos: D. Dorner, T. Krähenbühl, More details in [3]

\* G-APDs: Geiger-mode Avalanche Photodiodes

### Large unbiased data sample e.g. Mrk 501: ~ 1400 hours

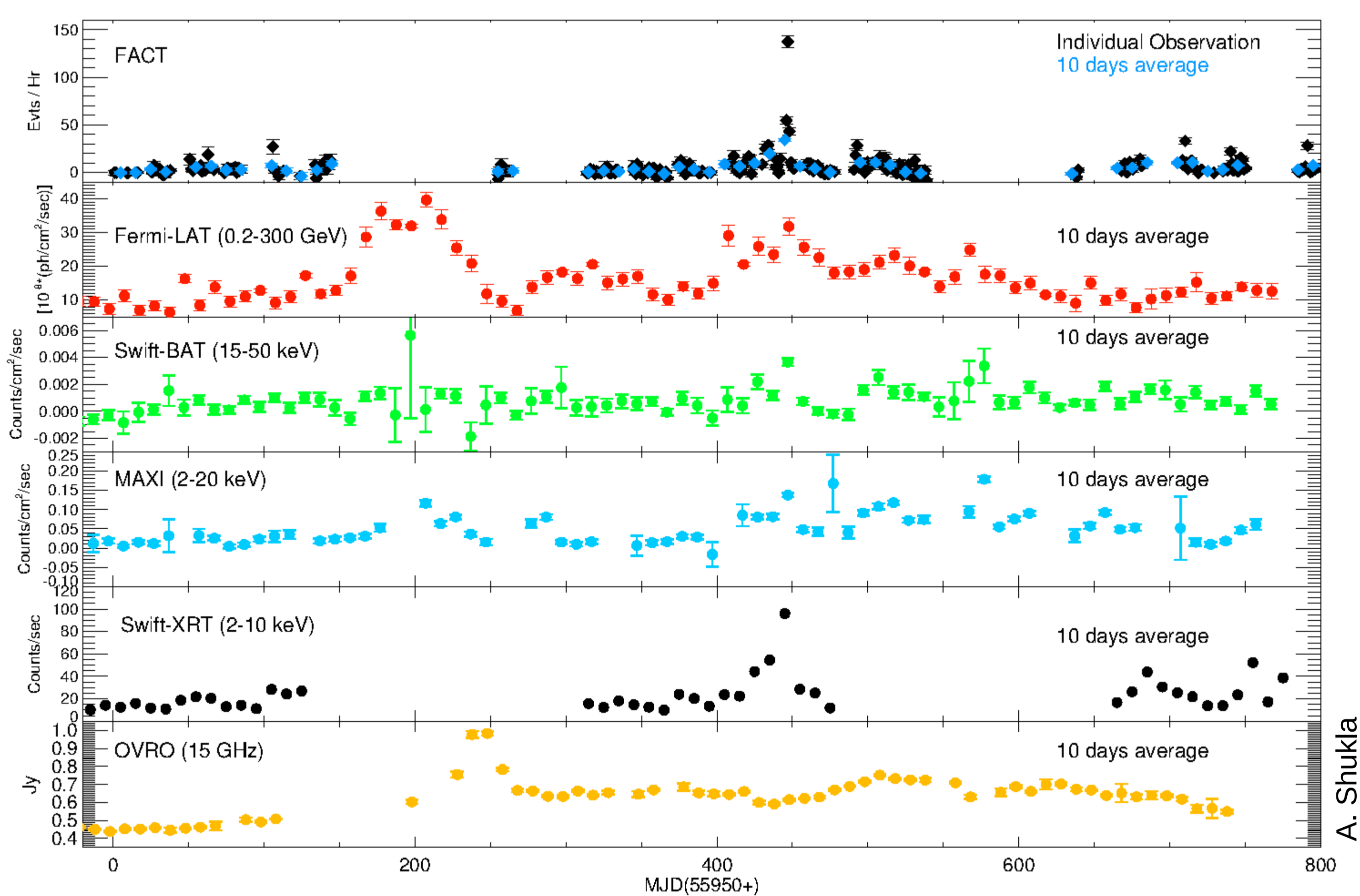


### Longterm Monitoring @ TeV Energies

### Quick Look Analysis and Flare Alerts

- Immediate processing on-site
- Available since December 2012
- Excess rates online after several minutes
- Results publicly available on website [5]
- Quick flare detection
- Eight flare alerts since March 2014
- Follow-up multi-wavelength observations
- Atel #6268 [6]

### Multi-Wavelength View on Mrk 421



A. Shukla

### Summary:

- Proof-of-principle for silicon-based photosensors (SiPM) in Cherenkov Astronomy
- Four Years of long-term monitoring: Mrk 421, Mrk 501, ...
- Multi-wavelength and Target-of-Opportunity observations

### TONIGHT

Publicly available

FACT Quick Look Analysis

Select date [2014] [02] [01] source [Mrk 421]

Select time binning [20min] and range [night] [Reset]

Displaying 'excess rate vs mjd' for Mrk 421 for the night 2014/02/01.

Excess Rate vs MJD

REMARKS:

- These are the results of a **fast quick look analysis** on site, i.e. they are **preliminary**.
- The quick look analysis includes all data, i.e. no data selection done.
- The shown curves are not fluxes but **excess rates** (number of excess events per effective time), i.e. there is a dependence on trigger threshold and zenith distance of the observation (with the current analysis for zenith distance > 40 degree and trigger threshold > 500 DAC counts).
- The curves are provided with 20 min binning and nightly binning.
- In case, you need further details about the data or a different binning, please do not hesitate to contact us.
- Time range 'all' refers to all data since 12.12.2012. For older data, please contact us.

If you intend to use the data or information from this website, please let us know for reference.

Please cite this webpage and the **FACT design paper** when using information from this webpage or any FACT data.

Reference FACT Design Paper: H. Anderhub et al. JINST 8 P6008 [ADS open access](#)

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Select:

- source
- date
- range
- time binning

Check out our results at:

<http://www.fact-project.org/monitoring>

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### References

- [1] H.Anderhub et al. (FACT Collab), JINST 8 (2013) P06008, arXiv:1304.1710 [4] <http://www.fact-project.org/smartfact>  
 [2] A.Biland et al. (FACT Collab), JINST 9 (2014) P10012, arXiv:1403.5747 [5] <http://www.fact-project.org/monitoring>  
 [3] M.L.Knoetig et al. (FACT Collab), ICRC 2013, ID 695, arXiv:1307.6116 [6] Stegmann et al. (HESS Collab.) Atel 6268

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