

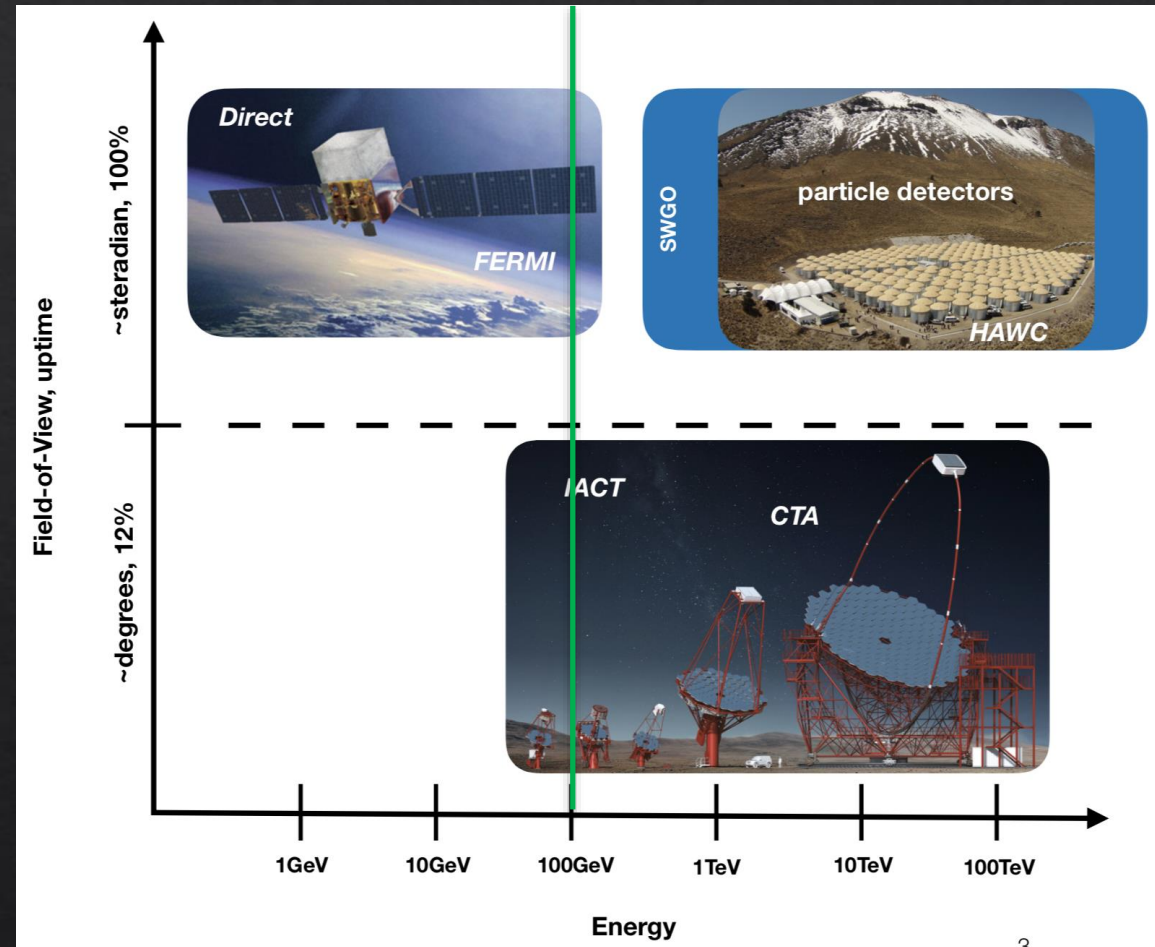
# Gamma-Ray astrophysics with current and future detectors

W.Blotz



# Motivation

- Southern Wide field-of-view Gamma-ray Observatory (SWGGO)
  - Planned to be built to monitor the Southern sky
  - Look for transient phenomena and extended sources
  - *What should be the energy range of the observatory?*



Img 1- Detectors comparison

# Fermi Gamma-Ray Space Telescope

- It studies high-energy emitting bodies, mostly AGN.
- It is shortsighted for low-energy emissions.
- Has a far better resolution than ground-based Gamma telescopes.
- It was launched in 2008.
- It maps the entire sky every 3 hours.



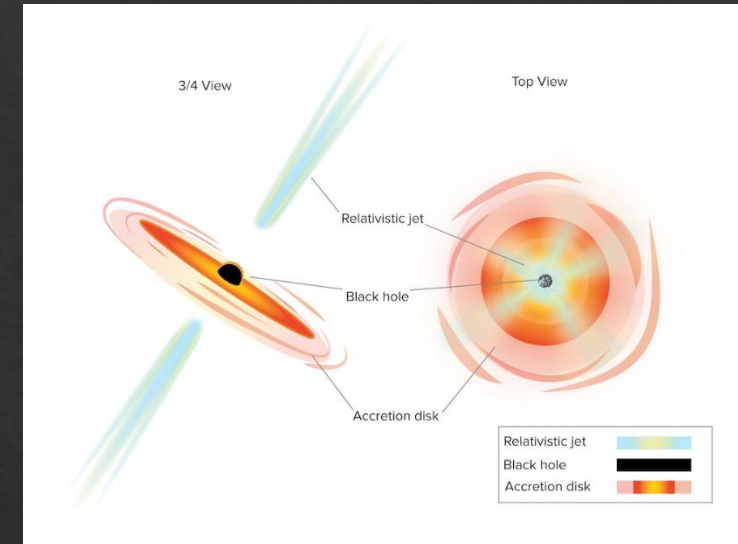
Img 2- Artist rendition of Fermi



# MRK-501

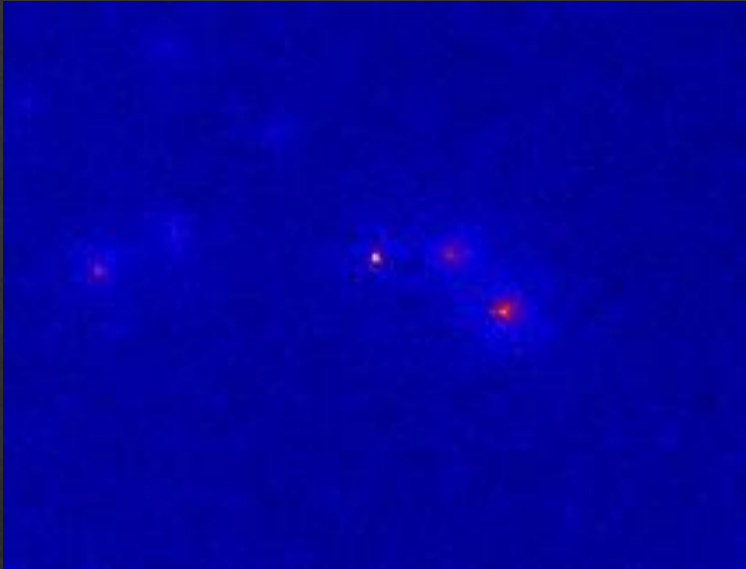
- ⑥ RA: 16h 53m 52.21s
- ⑥ De: 39° 45' 47.6''
- ⑥ It is situated in the northern hemisphere.
- ⑥ It is an elliptical galaxy.
- ⑥ The AGN is a blazar, responsible for the high energy emissions.

Img 3- Stock diagram of a blazar.



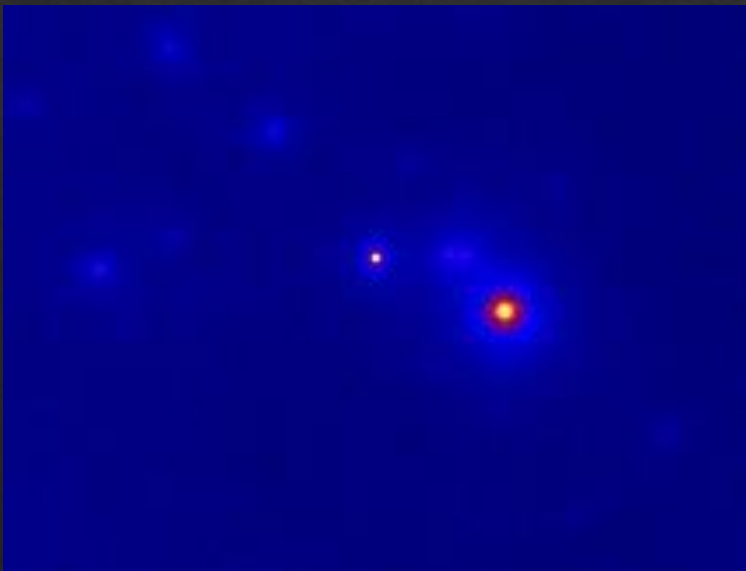
Img 4- Optical image of MRK-501

Img 5- One year of data.

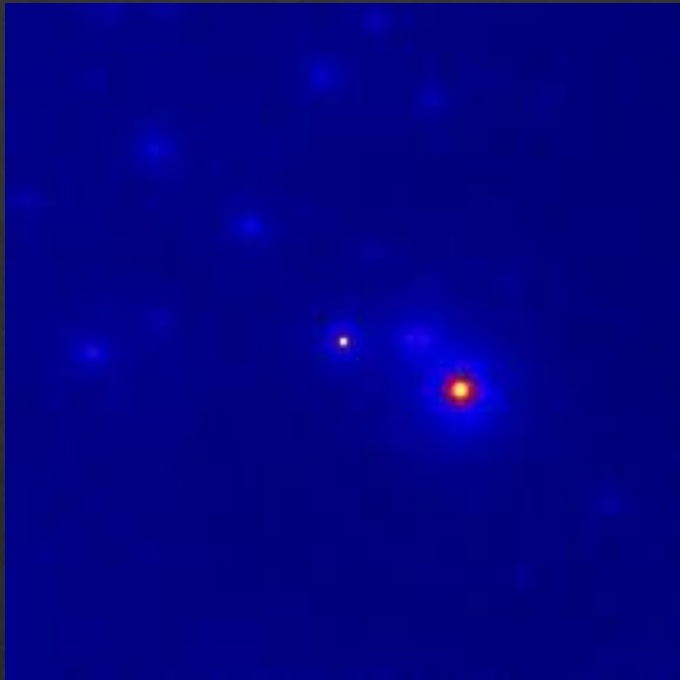


# Data treatment

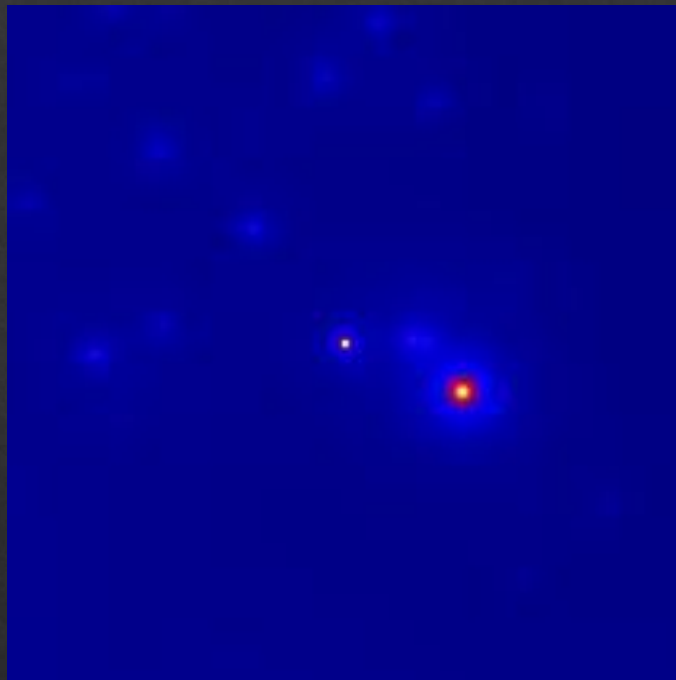
- Download 10 years of data
- Fit all the years together to improve the useful data.
- Build a model based on such data.
- Compare the model and the actual data to see its precision and accuracy.



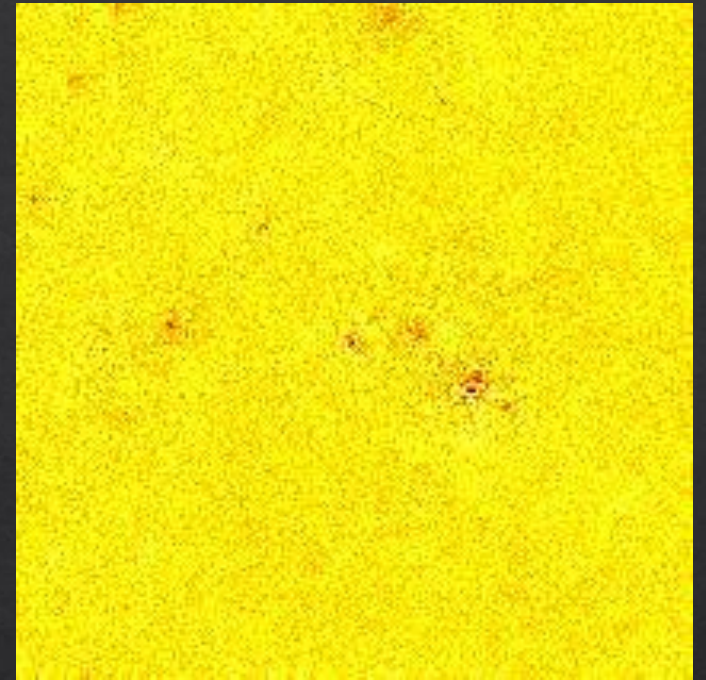
Img 6- Ten years of data.



Img 7- 10 years of data.



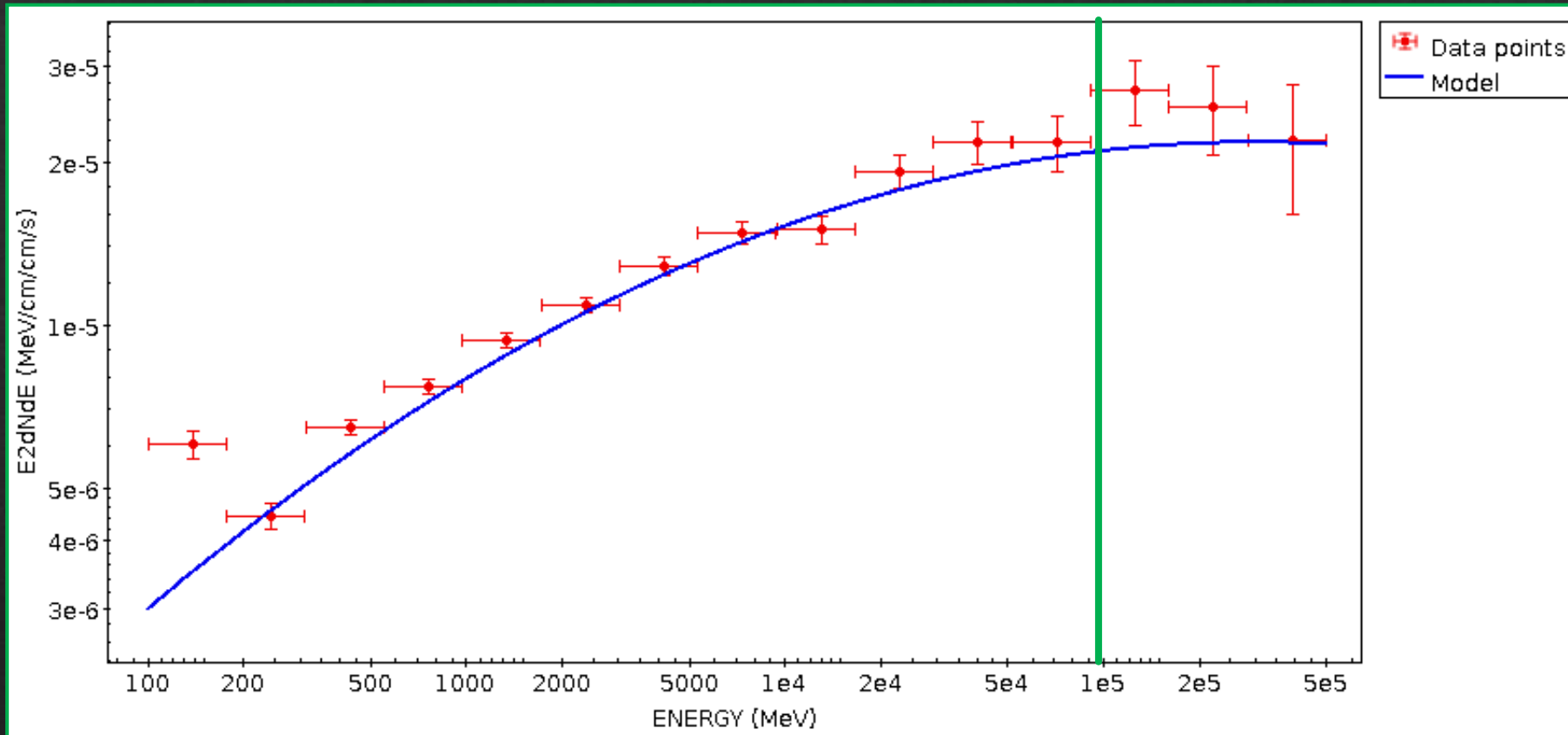
Img 8- Model of MRK-501 (Gamma region)



Img 9- Comparison between the model and the actual data.

# Model and Data comparison

# Fitting the data

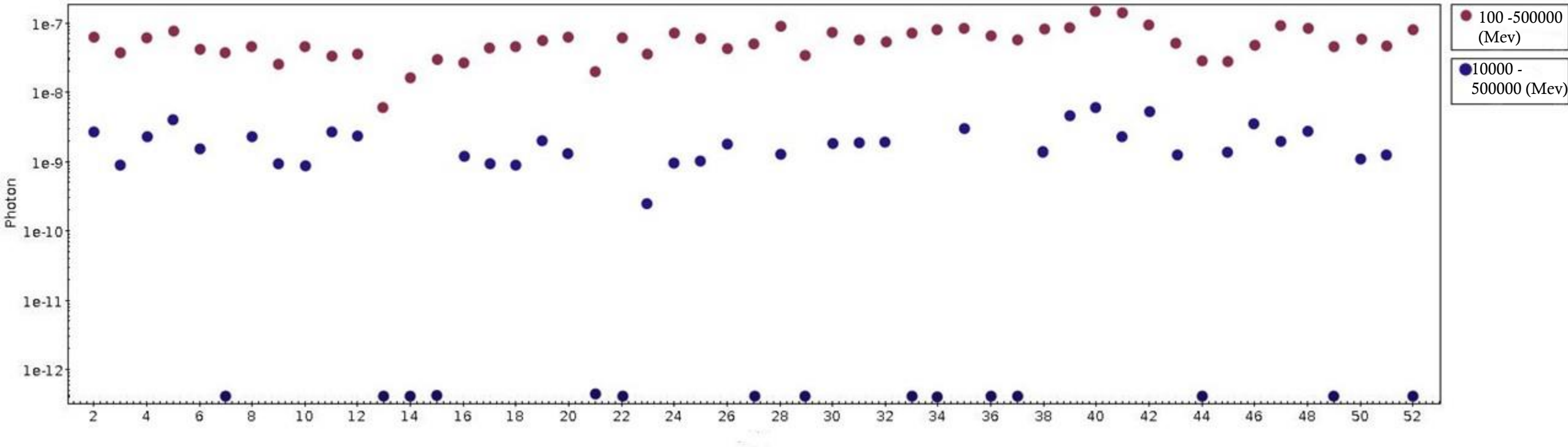


Img 10- Plot of energy flux vs energy magnitude.



# Next Steps

Img 11- Light Curve



- How strong are the flares.
- How the flares are distributed through time.
- Comparing the HE with radio and visual data.