

Reduction of 1es1959 data from Fermi/LAT

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- 1 – Observations
- 2 – Data reduction
- 3 – Light curve and spectra

1 - Observations

Fermi started operation in August 4th, 2008. The instrument worked almost without interruptions in survey mode: entire sky every 3 hours (2 orbits).

1es1959+650 is observed by about ½ hour every 3 hours: ~4 hours per day.

We'll be using data from Aug4th 2008 to Aug9th 2009 (~ 1 year).

The time window from [Sep20th to Nov05 \(2008\)](#) and from [June1st to Aug2nd \(2009\)](#) correspond to time windows with multi-frequency observations (radio, optical, X-ray and TeV).

2 – Data reduction

Science tools: ScienceTools-v9r15p2

Instrument response function: P6_V3_DIFFUSE

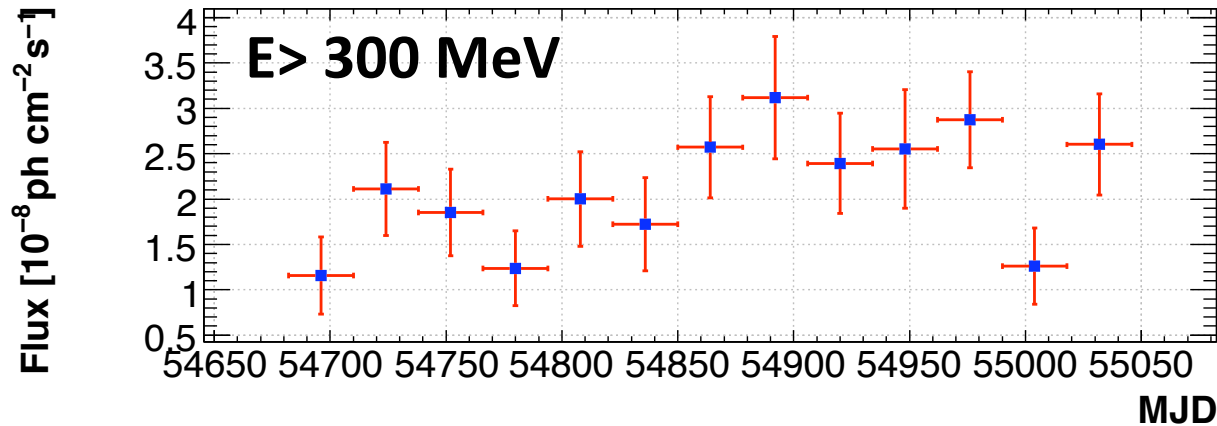
ROI = 10 degrees radius centered at 1es1959+650 position

Galactic and Extragalactic diffuse models: 2nd post launch revision (9 July 2009)

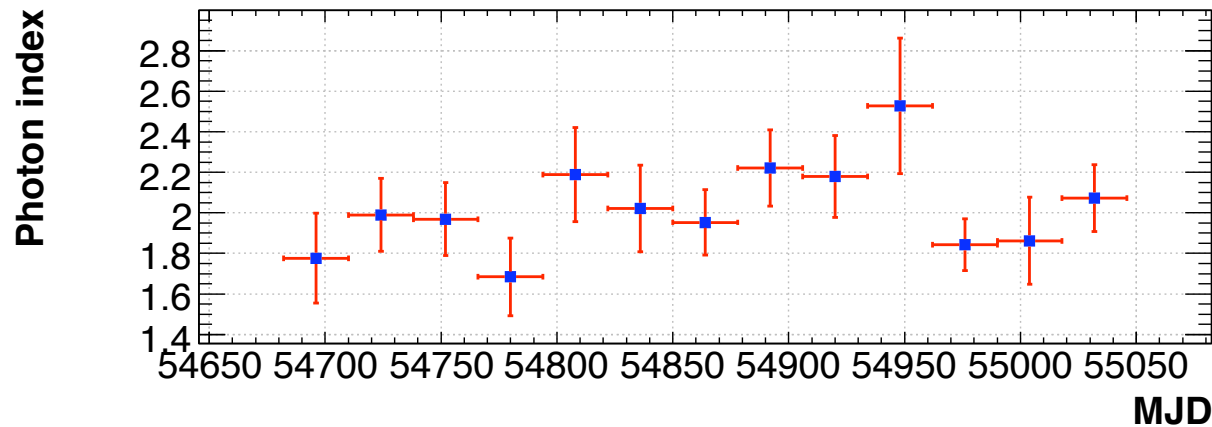
Energy cut: $E > 100$ MeV (*although Light Curves produced at $E > 300$ MeV*)

Zenith Angle cut : $\Theta < 105$ degrees

3 – Results Light curve for 1 year data (Aug4,2008 – Aug9,2009) Time bins = 28 days (4 weeks)

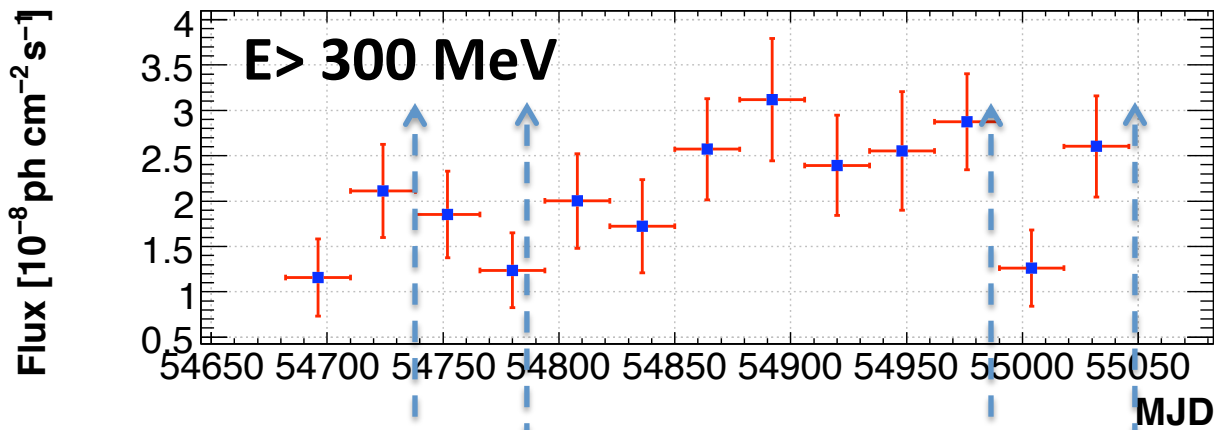


No big flux variations during this year, although one can see a slight increase in flux after Feb 2009 (MJD ~ 54850)

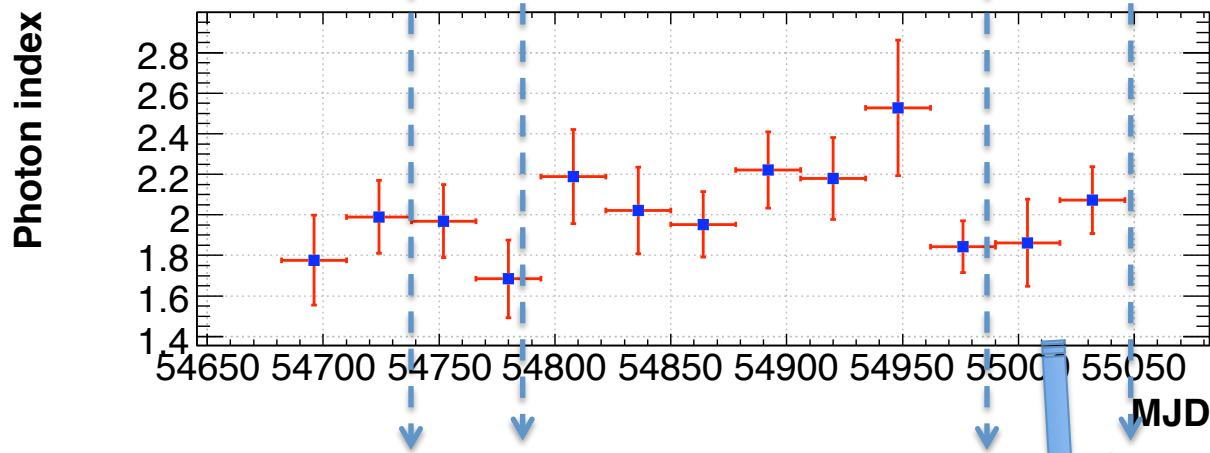


No significant spectral variations during the year

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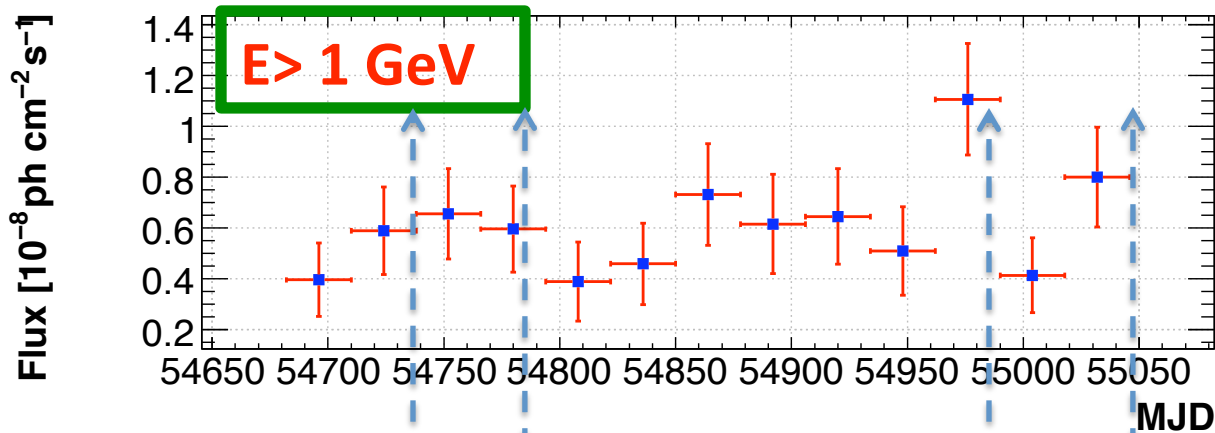
No big flux variations during this year, although one can see a slight increase in flux after Feb 2009 (MJD ~ 54850)



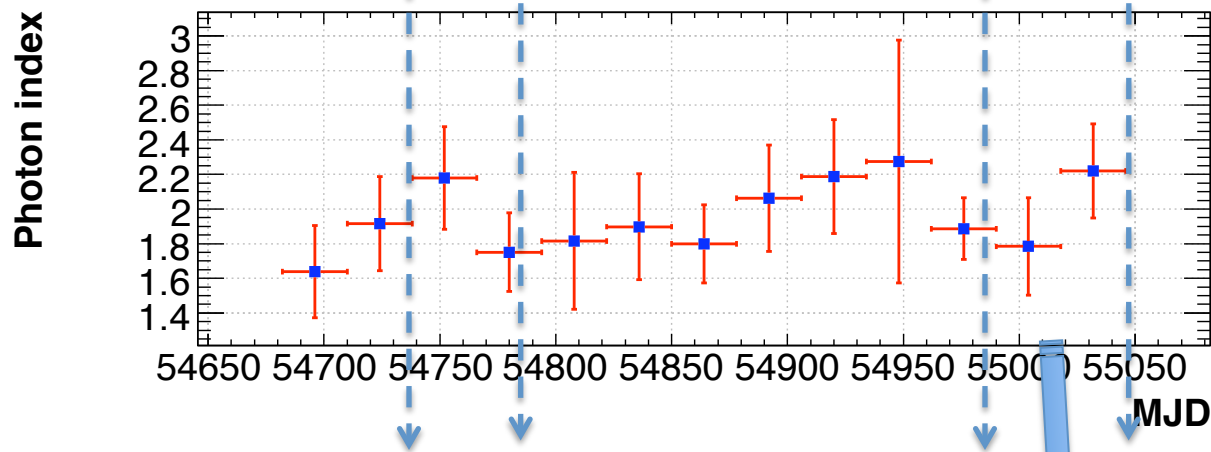
No significant spectral variations during the year

Change in flux by factor >2, although flux errors are large and thus not significant. **Looking forward to correlate with other Energy bands.**

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No significant spectral variations during the year

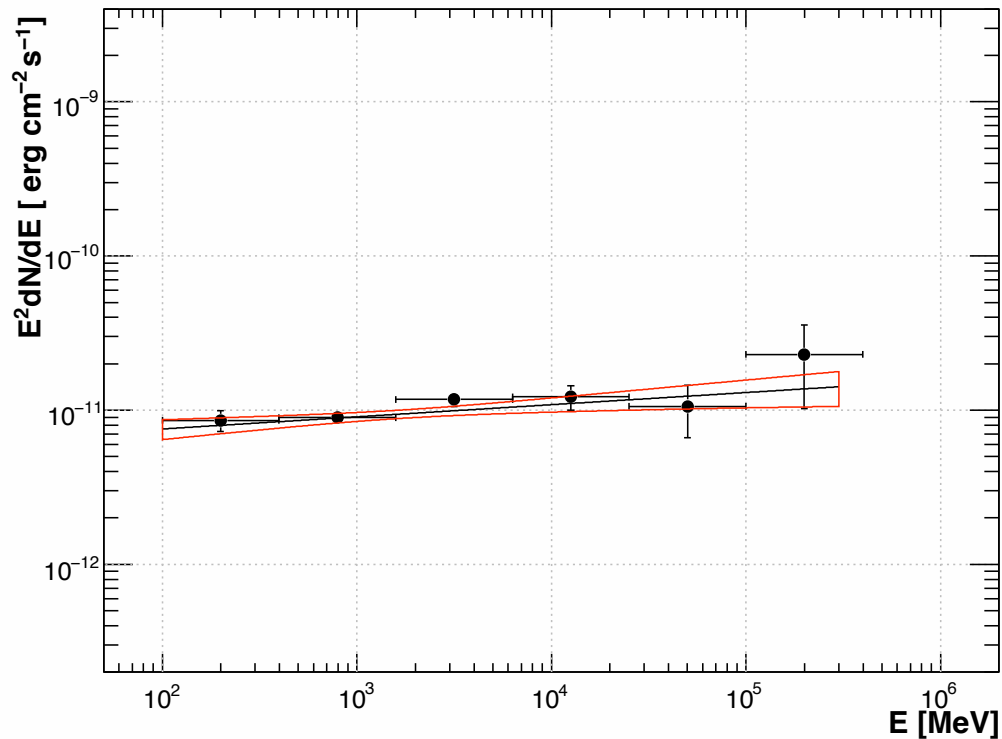
Change in flux by factor 2 is maintained when increasing the minimum energy of analysis.

Looking forward to correlate with other Energy bands.

3 – Results

Spectrum

1 year data



Spectrum can be resolved up to 400 GeV

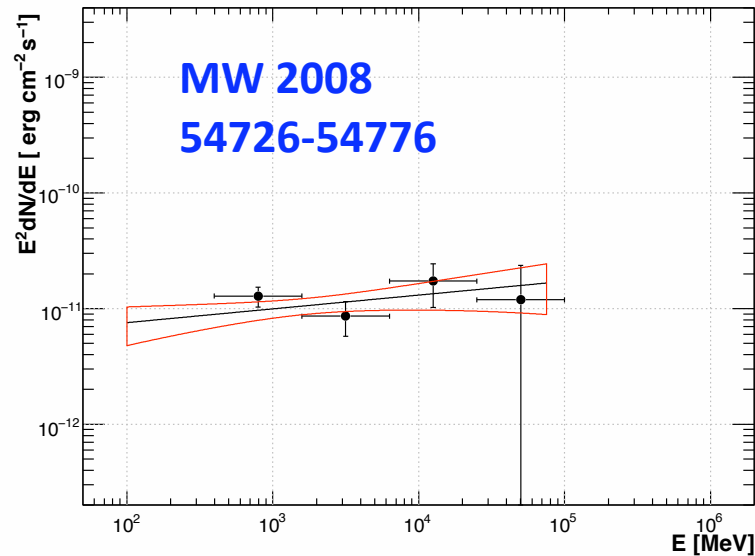
Although (predicted) number of photons in bin 100-400 GeV is only 4... Big (statistical) error bars due to low photon counts.

Spectrum can be fit with a simple power law (index 1.92+/-0.05)
Yet note that large error bars at the highest energies might hide a structure (turn over)

3 – Results

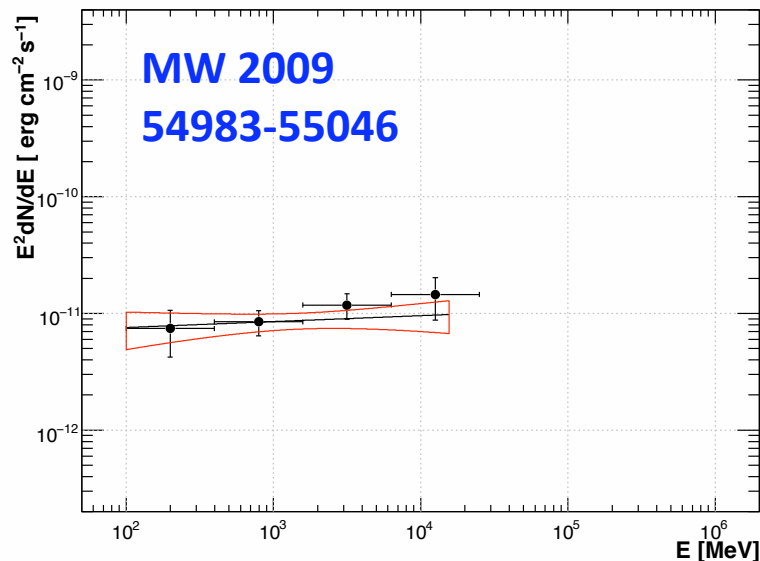
Spectrum

Time window with MW coverage



Spectrum can be resolved up to 25 GeV

Spectrum can be fit with a simple power law (index 1.89+/-0.12)



Spectrum can be fit with a simple power law (index 1.95+/-0.12)

No significant differences in the spectra from these two time windows