Status report of C023

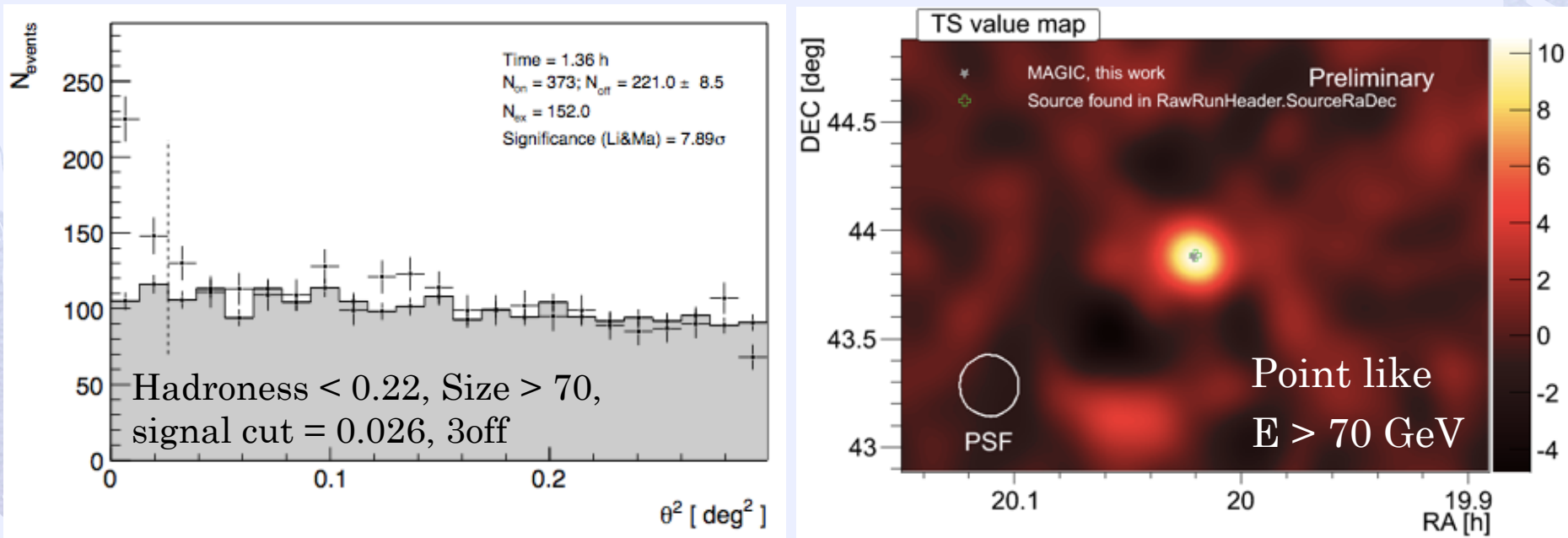Kazuhito Kodani

Outline – C023

C023 (MAGIC J2001+435)

- High frequency peaked BL Lac

- Consistent with the location of 2FGL J2001.1+4352 & radio source MG4 J200112+4352

- z = uncertain

✧ Detection: July 16th 2010

✧ Low state check:
during July to September 2010, without July 16th

✧ Summary

Detection 2010-07-16

Time = 1.36 h
N_{on} = 373; N_{off} = 221.0 ± 8.5
N_{ex} = 152.0
Significance (Li&Ma) = 7.89σ

Hadroness < 0.22, Size > 70,
signal cut = 0.026, 3off

TS value map

MAGIC, this work   Preliminary
Source found in RawRunHeader.SourceRaDec

Point like
E > 70 GeV

PSF

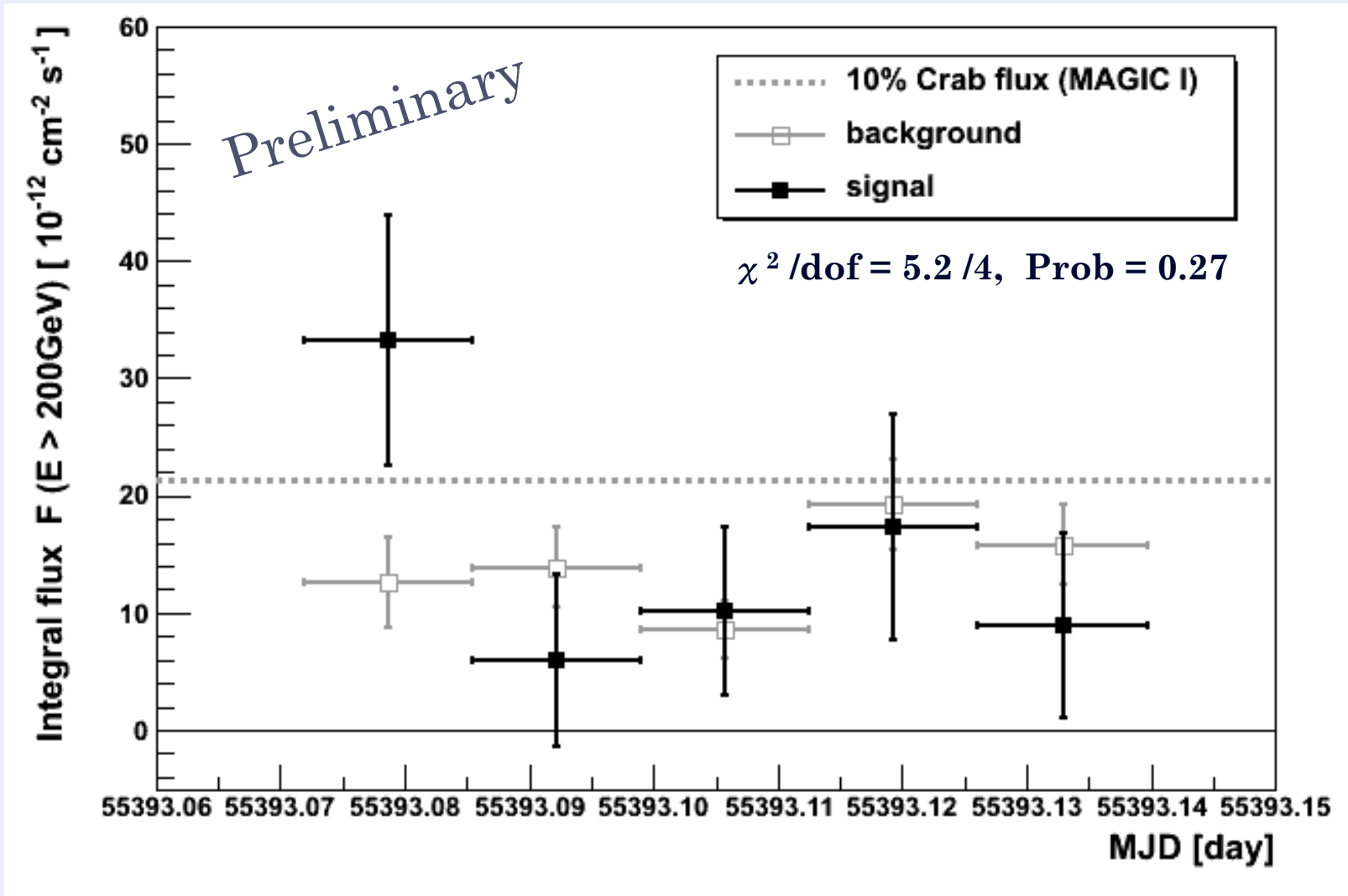θ^2 distribution: live time = 1.36 hours
                            excess = 152
                            significance = 7.89 sigma

Skymap position: Deviation (Psi) = 0.013 ± 0.015 deg
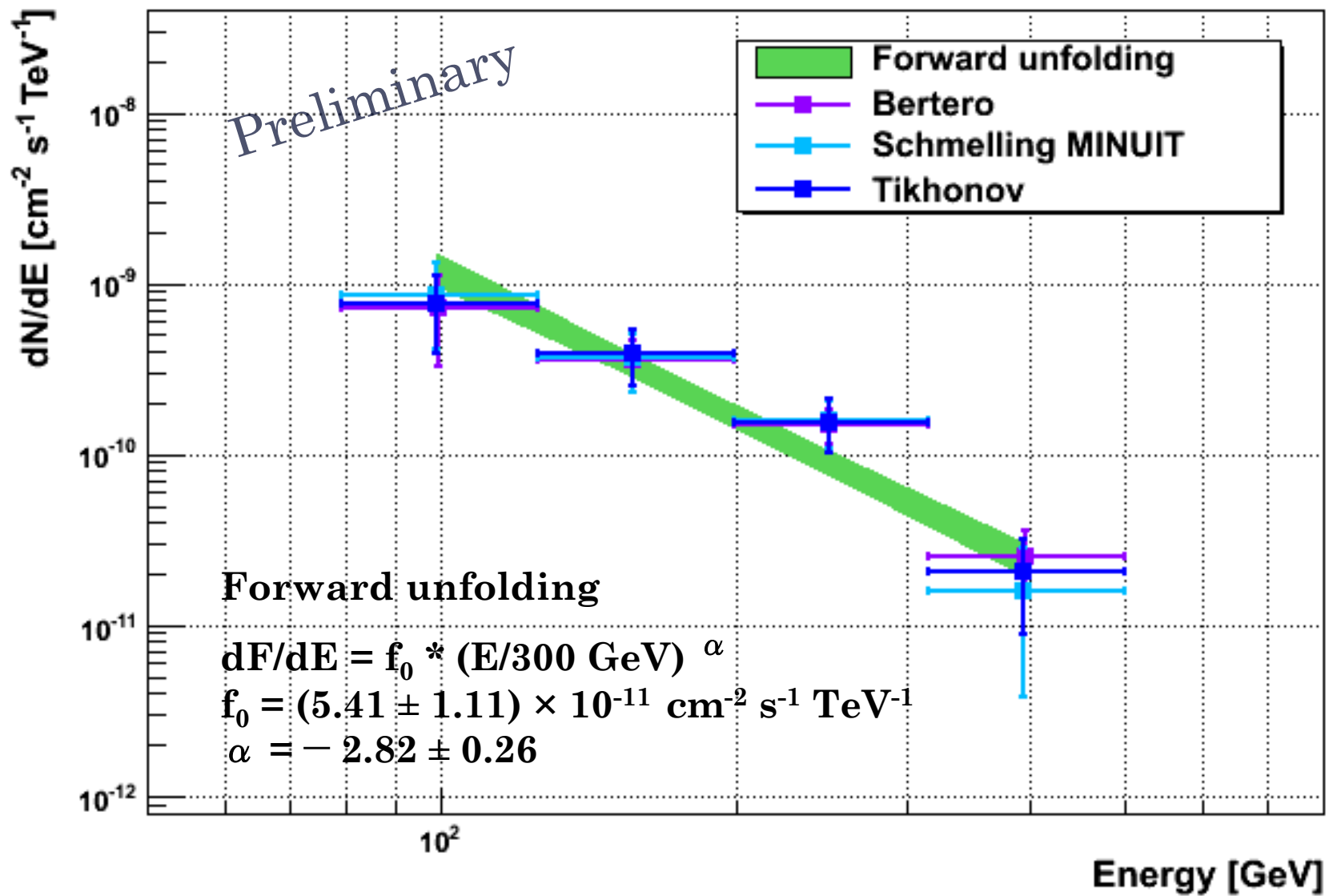
Position is consistent with the location of Fermi source

3

Intra-night LC

Light curve is high during first 20 minutes
Constant flux = $1.27 \pm 0.37 \times 10^{-11}$ cm^{-2} s^{-1}
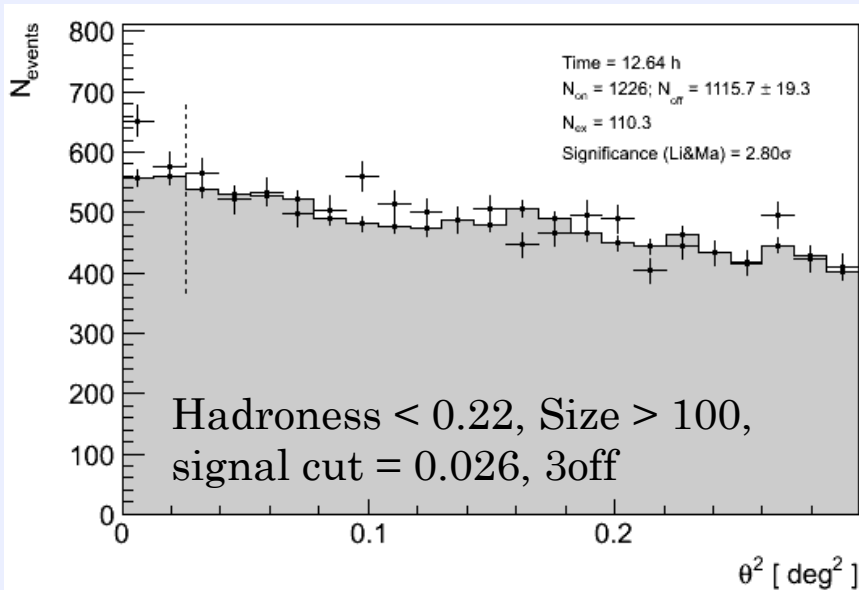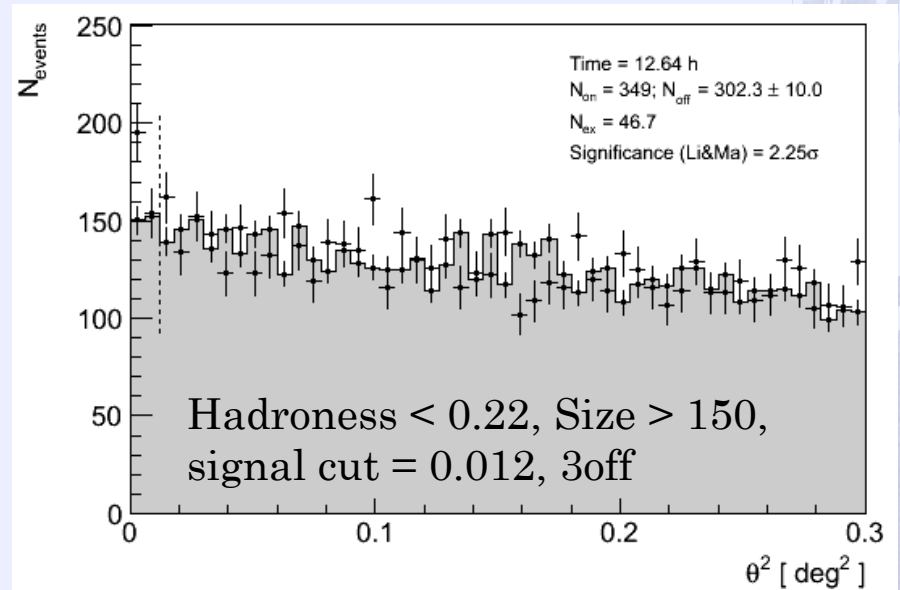
Unfolding

Low state check

2010 July to September (without July 16th)
-   11 nights data

Stacked theta 2 plots:

Energy above 100 GeV

Energy above 150 GeV

No significant signal, less than 3 sigma

Summary
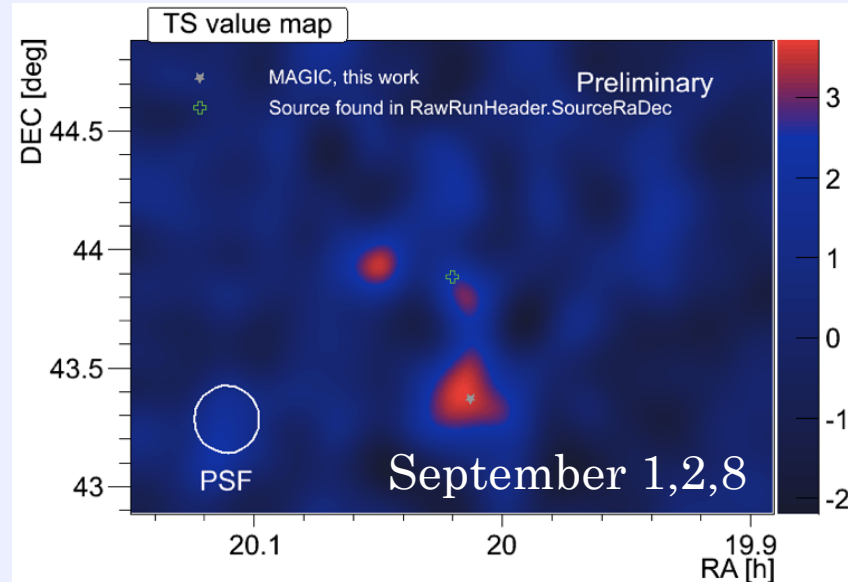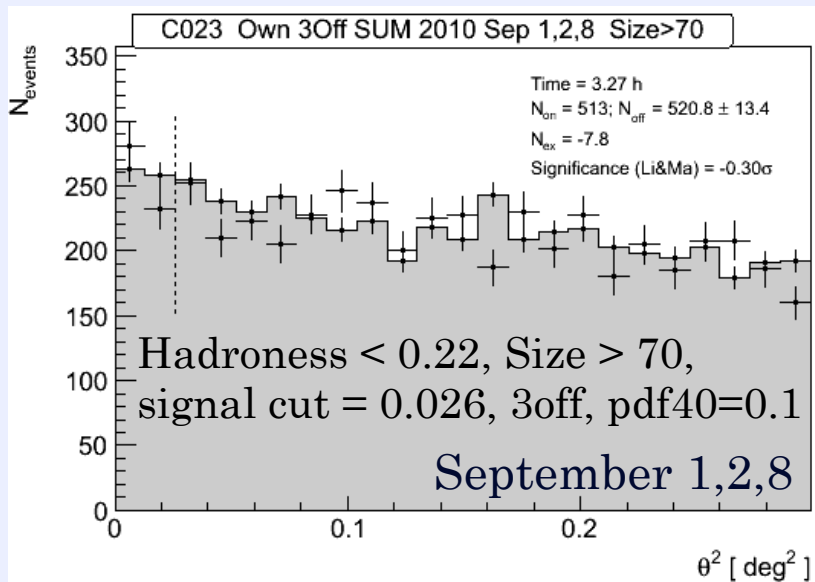
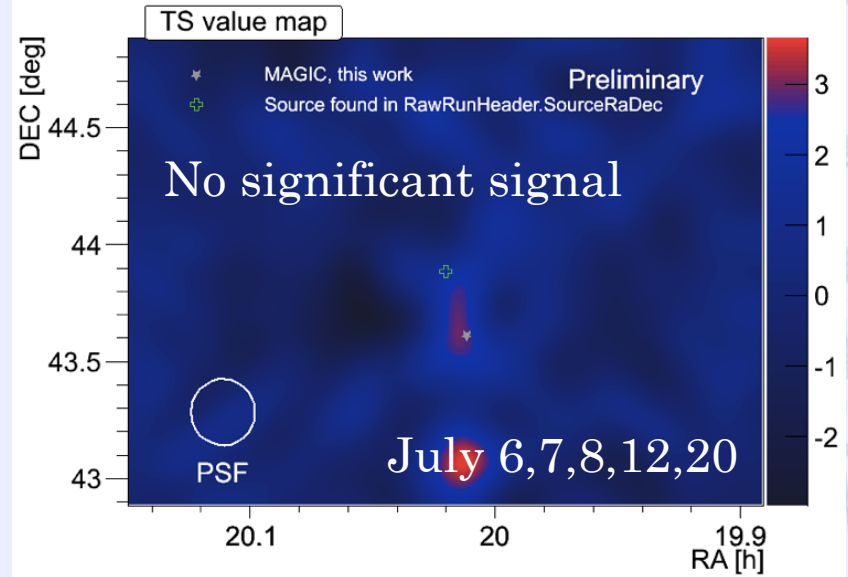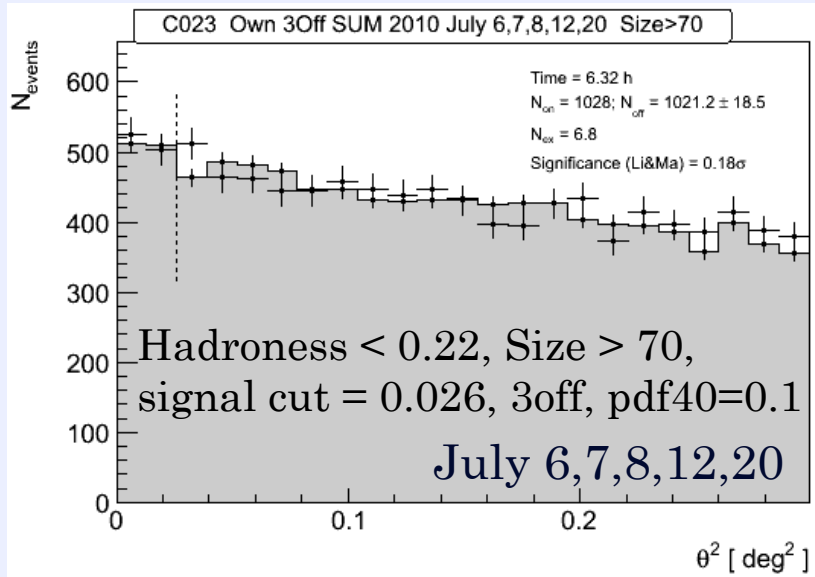VHE emission from C023 on July 16th 2010, only one day

✧ Significance ~ 7.9 sigma (E > 70 GeV) for 1.36 hours

✧ Sky map position is consistent with location of the Fermi source

✧ Intra-night LC is high during first 20 minutes

Low state data check

✧ Stacked theta 2 plots: 11 night data in 2010

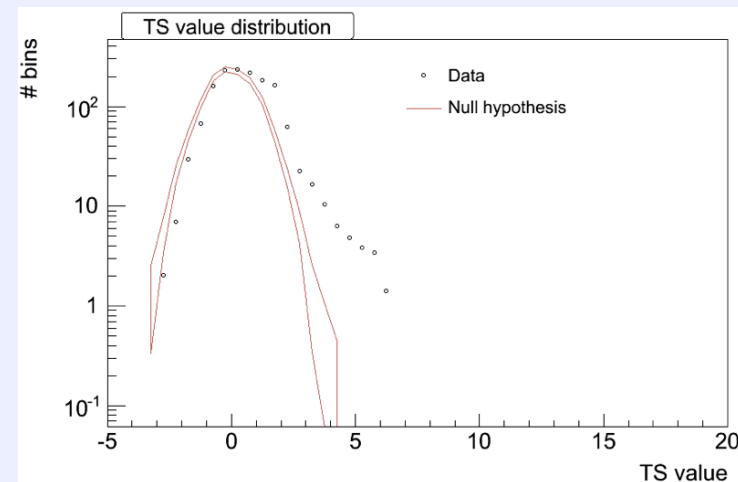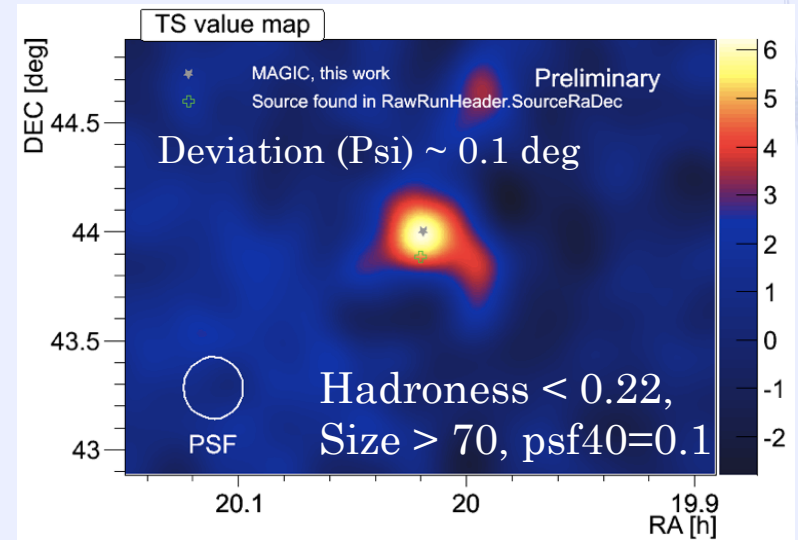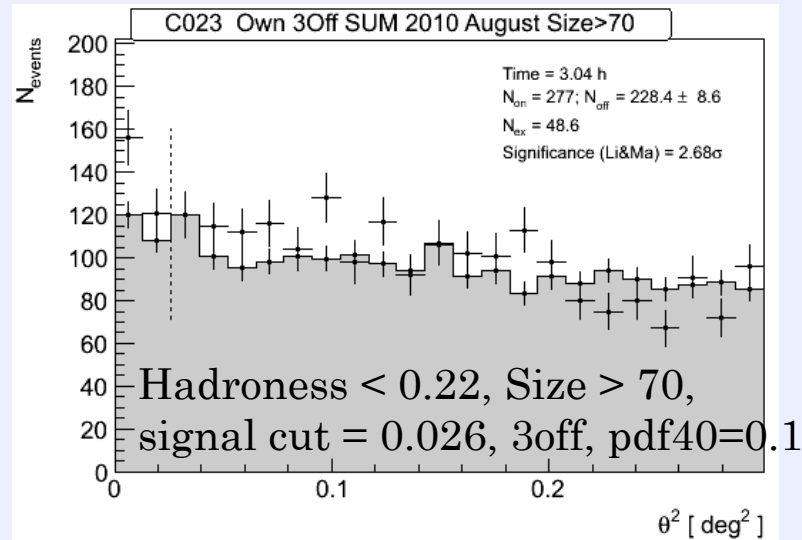   → No significant signal, less than 3 sigma

Appendix

Low state data check I

C023 Own 3Off SUM 2010 July 6,7,8,12,20 Size>70

Time = 6.32 h

N_{on} = 1028; N_{off} = 1021.2 ± 18.5

N_{ex} = 6.8

Significance (Li&Ma) = 0.18σ

Hadroness < 0.22, Size > 70,
signal cut = 0.026, 3off, pdf40=0.1

July 6,7,8,12,20

TS value map

MAGIC, this work   Preliminary
Source found in RawRunHeader.SourceRaDec

No significant signal

PSF

July 6,7,8,12,20

C023 Own 3Off SUM 2010 Sep 1,2,8 Size>70

Time = 3.27 h

N_{on} = 513; N_{off} = 520.8 ± 13.4

N_{ex} = -7.8

Significance (Li&Ma) = -0.30σ

Hadroness < 0.22, Size > 70,
signal cut = 0.026, 3off, pdf40=0.1

September 1,2,8

TS value map

MAGIC, this work   Preliminary
Source found in RawRunHeader.SourceRaDec

PSF

September 1,2,8

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Low state data check II

✧ August 5, 10, 16 data

Inconsistent between theta 2 plot and sky map at August data

Hadroness < 0.22, Size > 70, signal cut = 0.026, 3off, pdf40=0.1

Deviation (Psi) ~ 0.1 deg

Hadroness < 0.22, Size > 70, psf40=0.1

Low state data check III
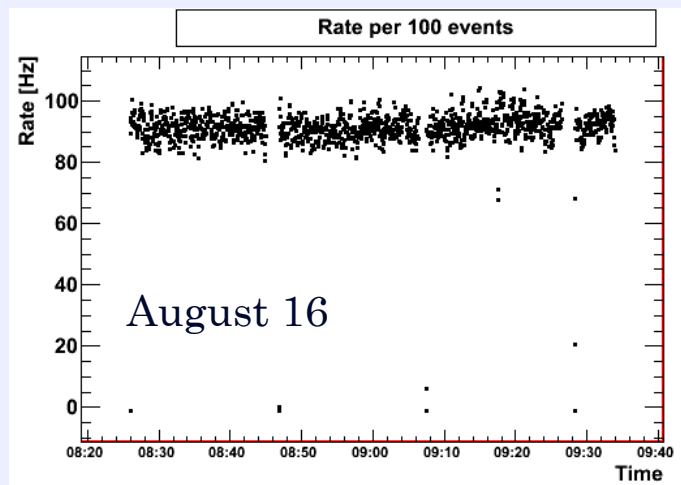
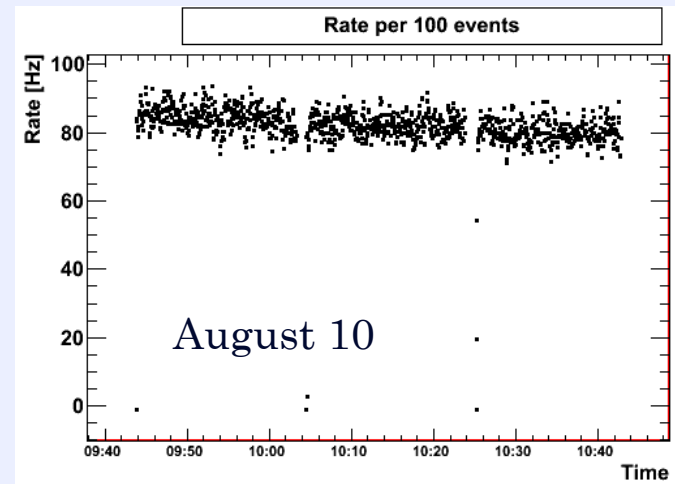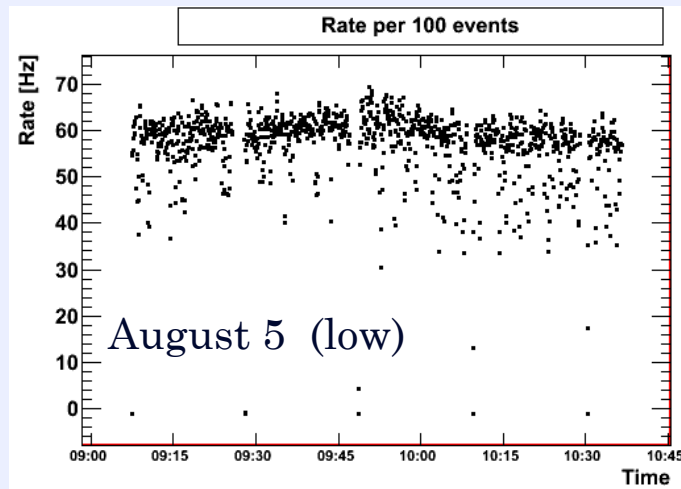✧ August 5, 10, 16 data   Caspar output
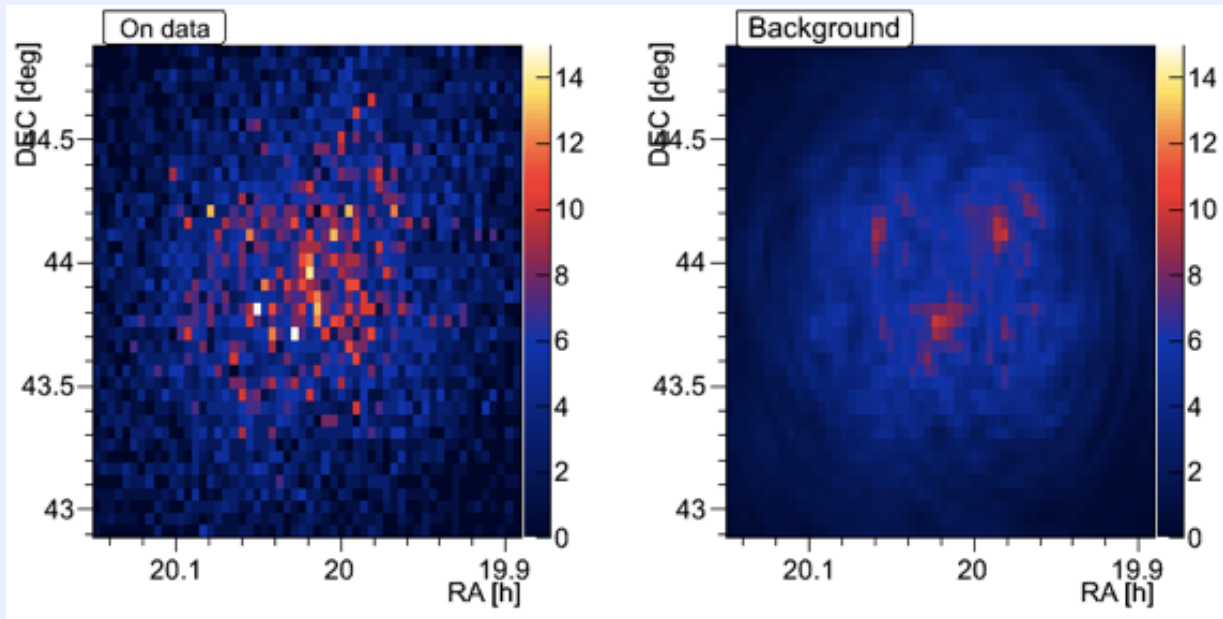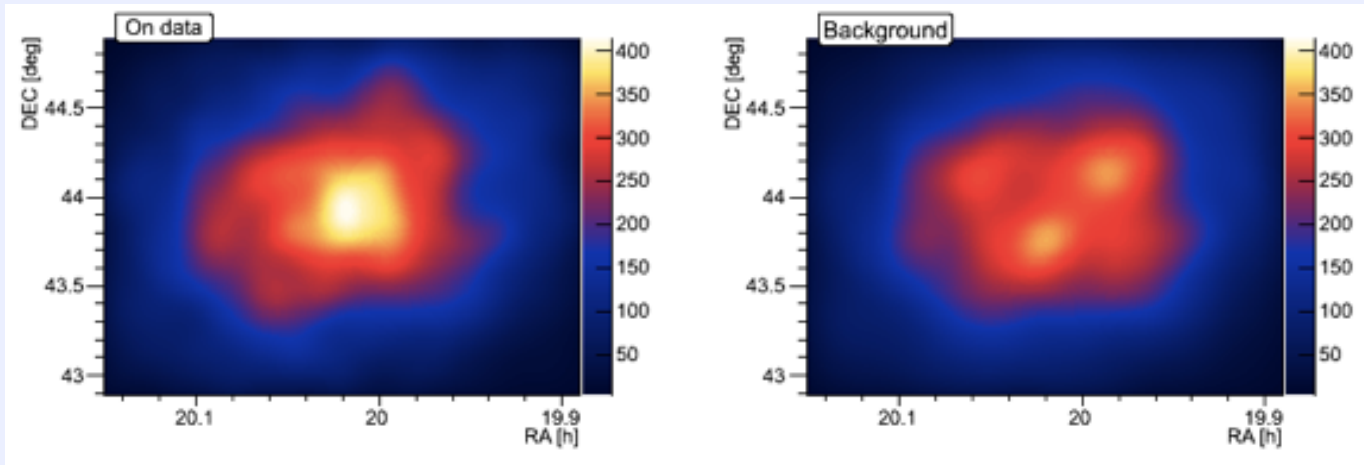
Background contain "hotspots"

Rate (superstar)

✧ August 5, 10, 16 data

Superstar rate:
Data quality at August was not good, rate was low.

August 5 (low)

August 10

August 16

Low state data check IV

✧ August 5, 10, 16 data

Check: higher energy cuts (E > 150 GeV)

Hadroness < 0.22, Size > 150, signal cut = 0.012, 1off, psf40=0.065

Hadroness < 0.22, Size > 150, psf40=0.065
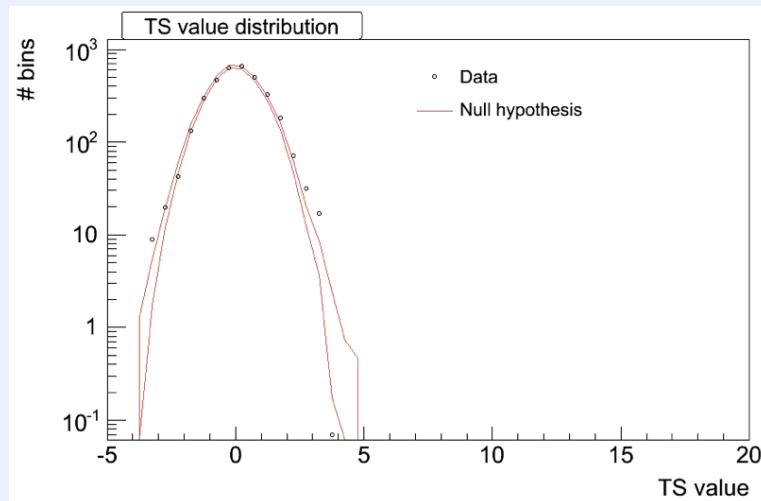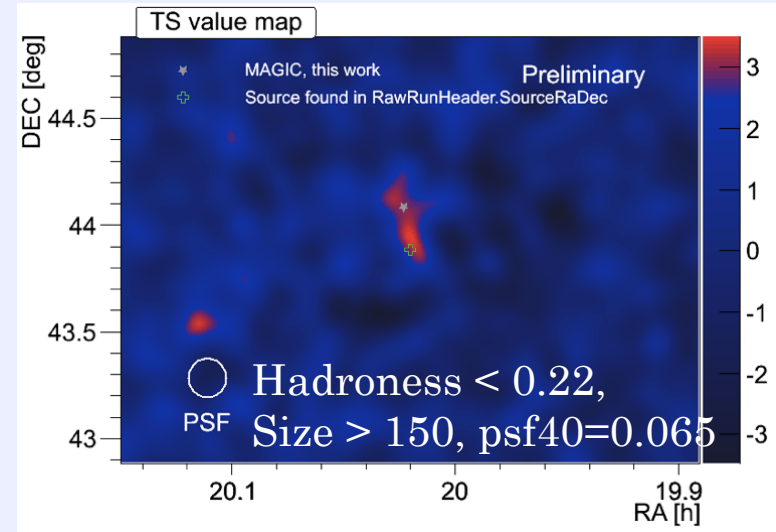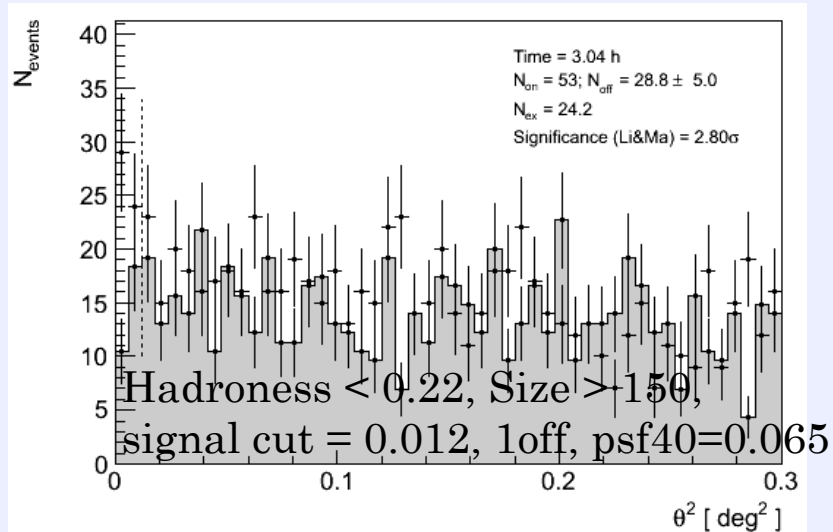
There is no inconsistency between odie and caspar at higher energies

(problem only in lower energy)