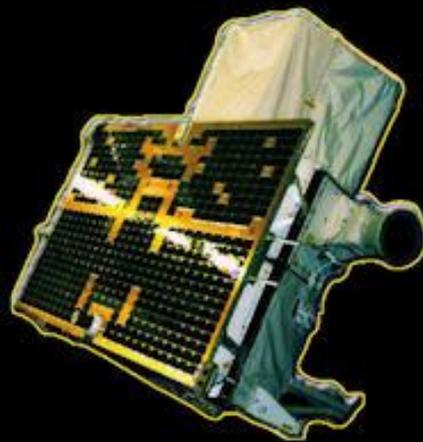


# **AGILE: 8 AND COUNTING**



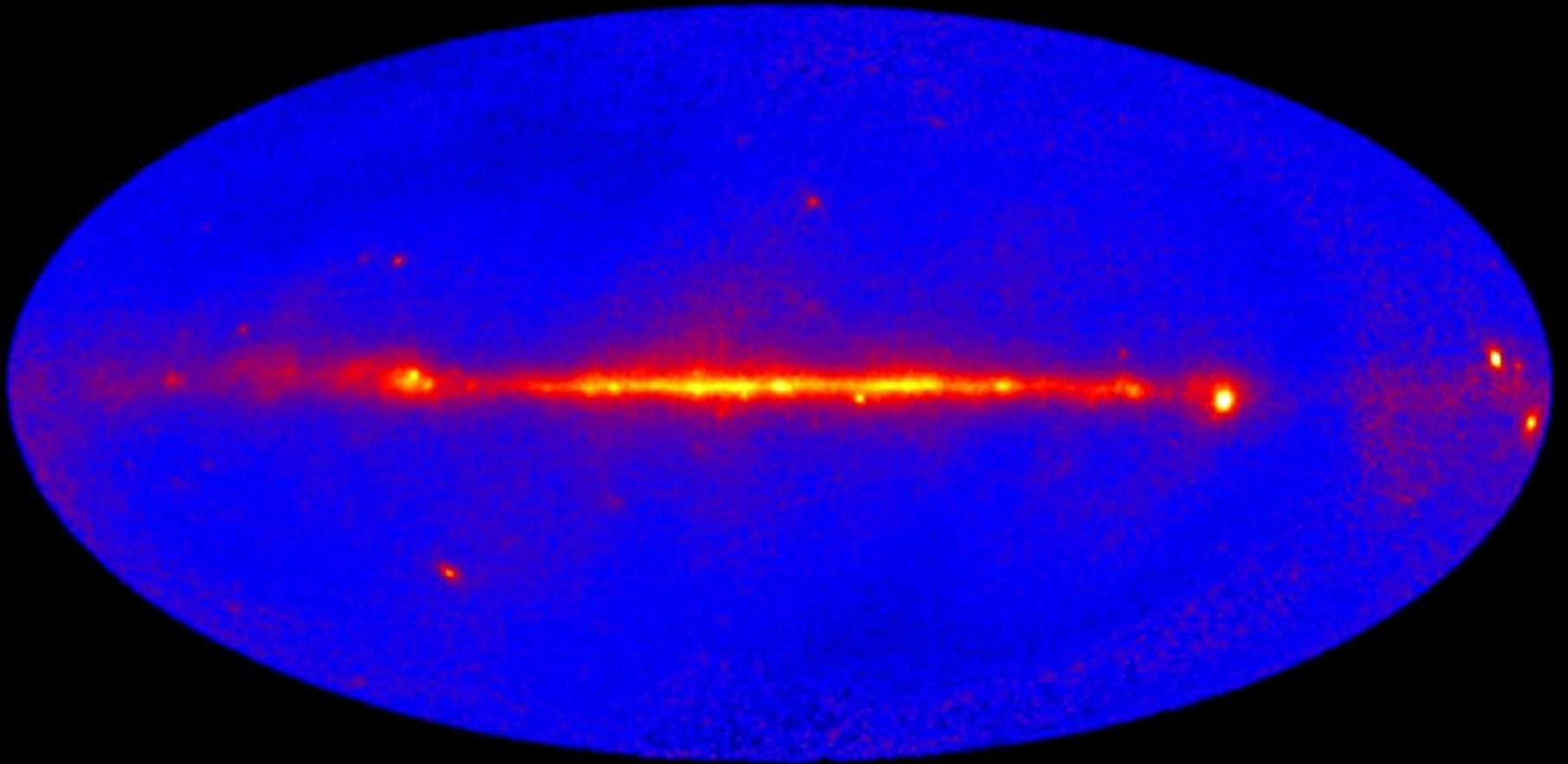
**ASI, Rome**  
**May 25-26, 2015**



# The 13th Workshop, the 8th year in orbit

- **Galactic astrophysics**
- **Extragalactic astrophysics**
- **The industry legacy**
- **Terrestrial physics**

# The AGILE gamma-ray sky ( $E > 100$ MeV)



# The AGILE gamma-ray sky ( $E > 100$ MeV)

Time elapsed since the AGILE launch on April 23, 2007 at 10:00 GMT

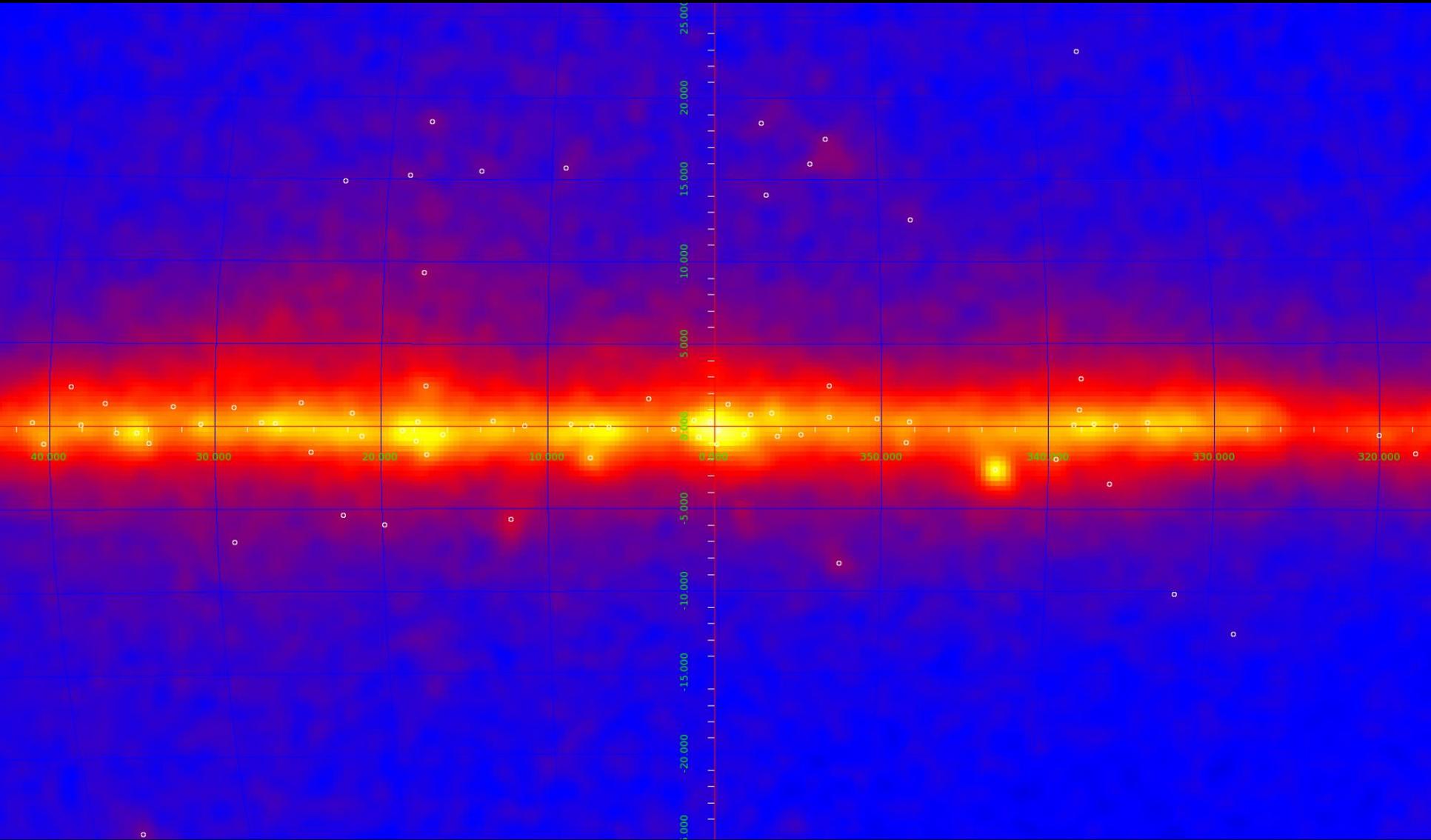
Days	Hours	Mins	Secs
2953	11	00	29

- **Satellite in nominal spinning mode**
  - **Battery, solar panels, OBDH are nominal**
- **Instrument**
  - **GRID is nominal**
  - **MCAL is nominal**
  - **AC is nominal**
  - **Super-A, only ratemeters**

- The instrument confirms its excellent PSF above 100 MeV
- Good sensitivity in spinning mode, several ATEs issued on transient sources (recently, no Crab flares or Cygnus X-3 flares...no 3C 454.3 or 3C 279 flares...)

- **Focus on the 50-200 MeV energy range, AGILE can say a lot on emission in this range**
- **2nd AGILE source catalogue (pointing mode)**
- **3rd AGILE source catalogue (spinning mode)**

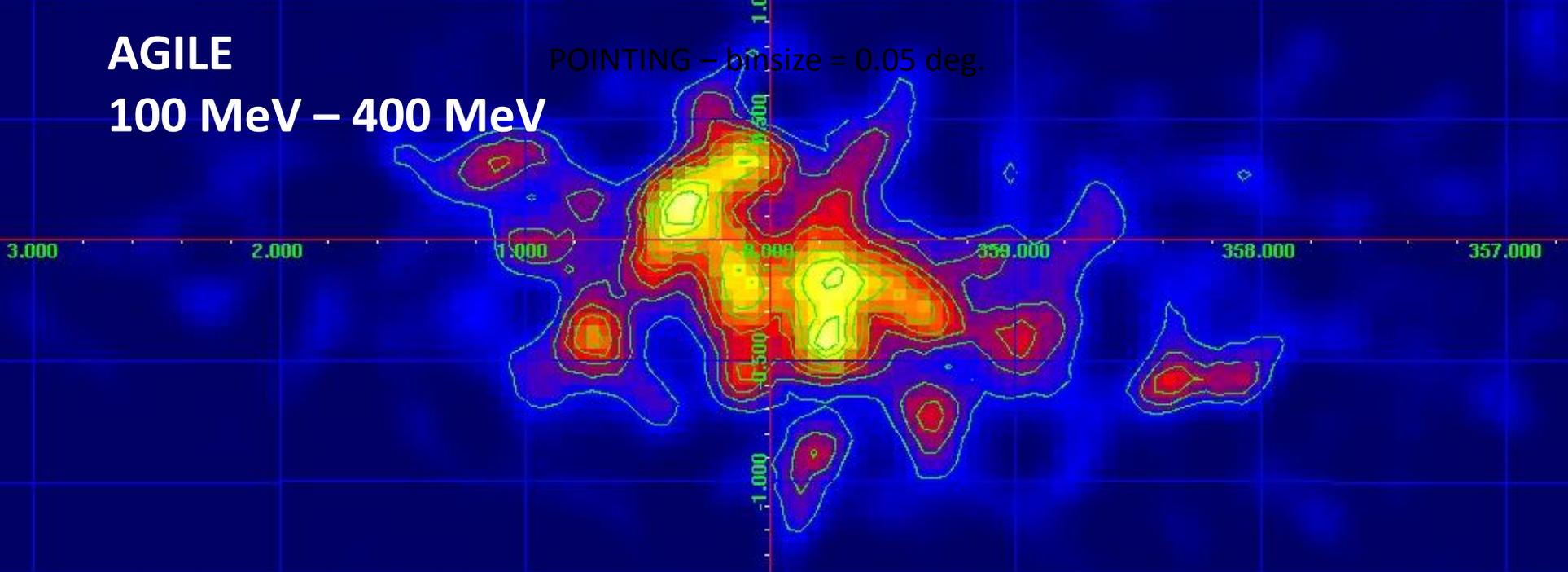
# The inner Galaxy seen by AGILE ( $E > 100$ MeV)



**AGILE**

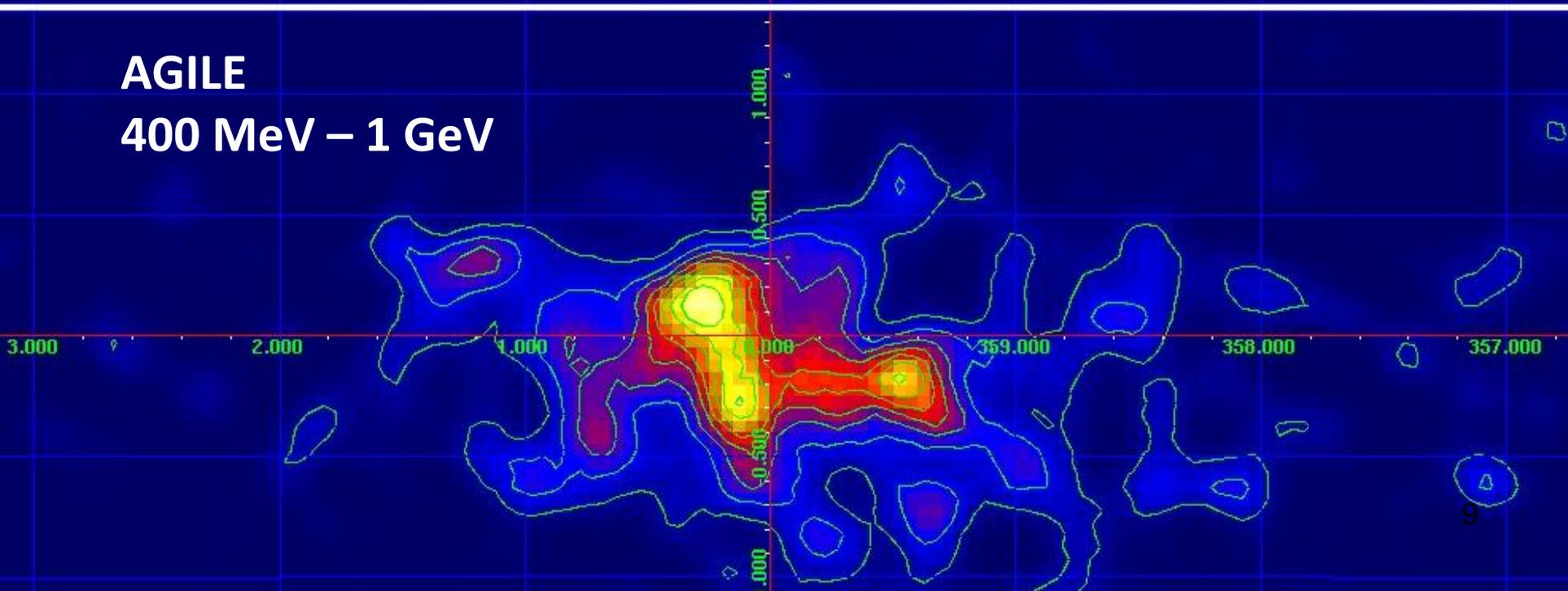
**100 MeV – 400 MeV**

POINTING – binsize = 0.05 deg.



**AGILE**

**400 MeV – 1 GeV**



# developments 1

- Very large database and legacy from pointing (2007-2009) & spinning (2010-today) data
- Search for new sources, new transients in the Galaxy and outside
- New projects in star formation studies, role of CRs in star formation, diffuse emission, correlation with Herschel, Planck, HI surveys

# developments 2

- continuous monitoring of sources and very rapid alerts
- the “Galactic scan” project

# developments 3

- Theoretical investigations on micro-quasars and gamma-ray binaries
- Theoretical work on gamma-ray blazars

# AGILE and the Earth

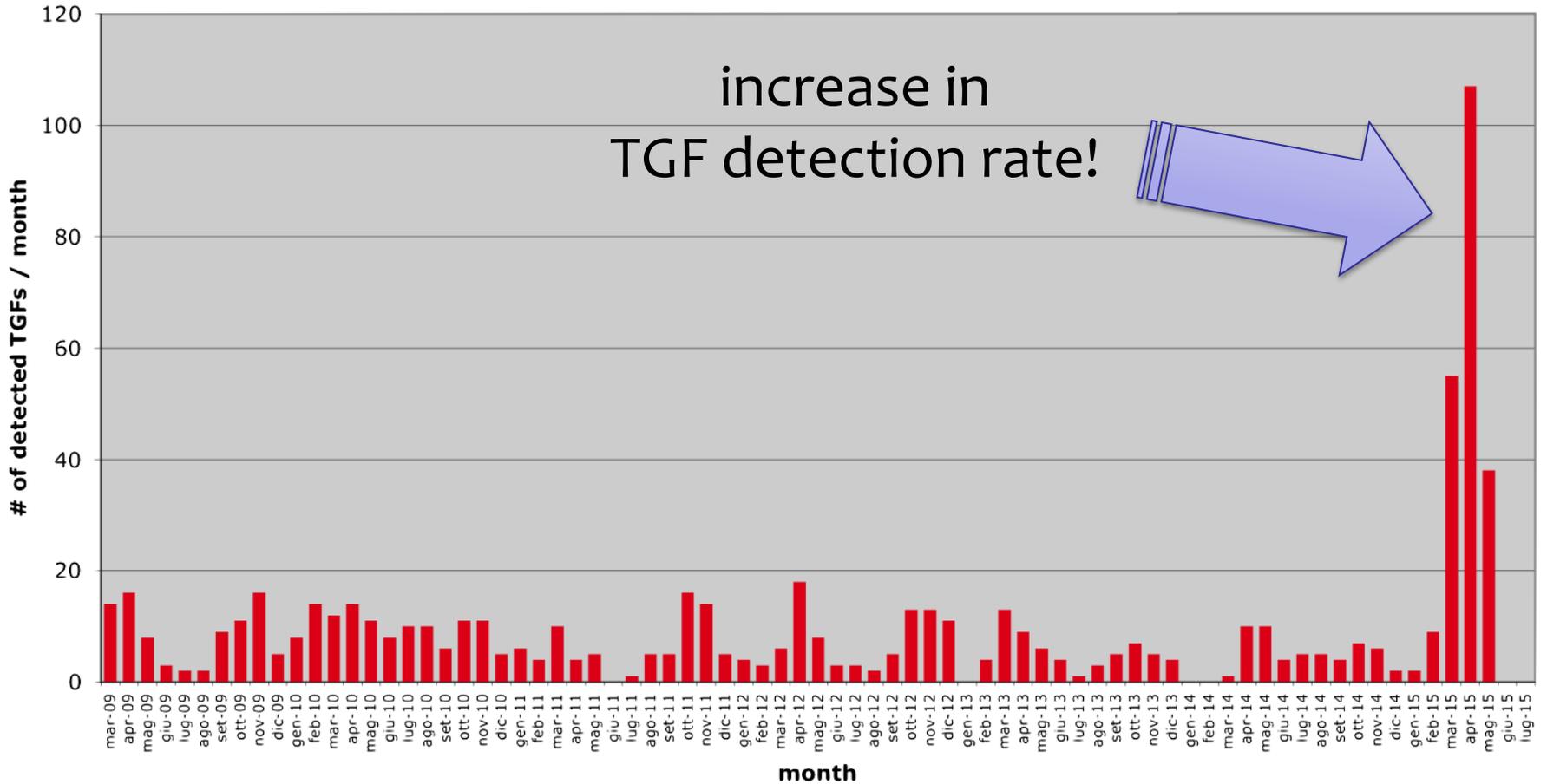
- **Detection of Terrestrial Gamma-Ray Flashes (TGFs)**
- **NEW:**  
**AGILE as a particle monitor**

# AGILE and the Earth

- much improved detection capability for TGFs (rate  $> 10$  times larger than before)
- detection of repeated TGFs from the same thunderstorm
- meteorology of TGFs
- impacts of TGFs
- now possible to search for “positron events”
- gamma-ray mapping of the Earth

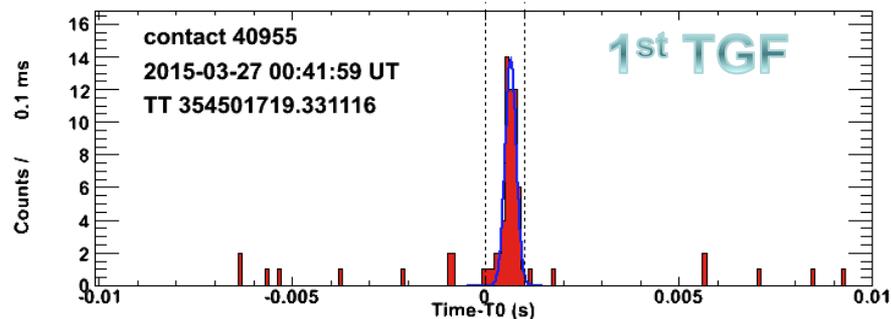
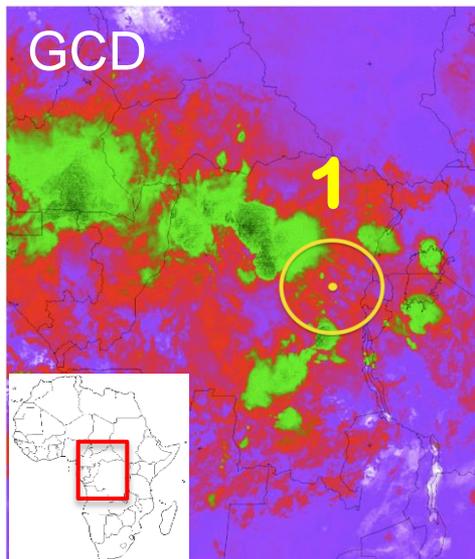
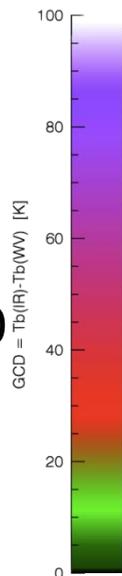
(thanks to A.Argan, M. Marisaldi, A. Ursi, ASI, TZP, TAS-I)

**AGILE TGF monthly detection rate**  
**[02/03/2009 ÷ 17/05/2015]**



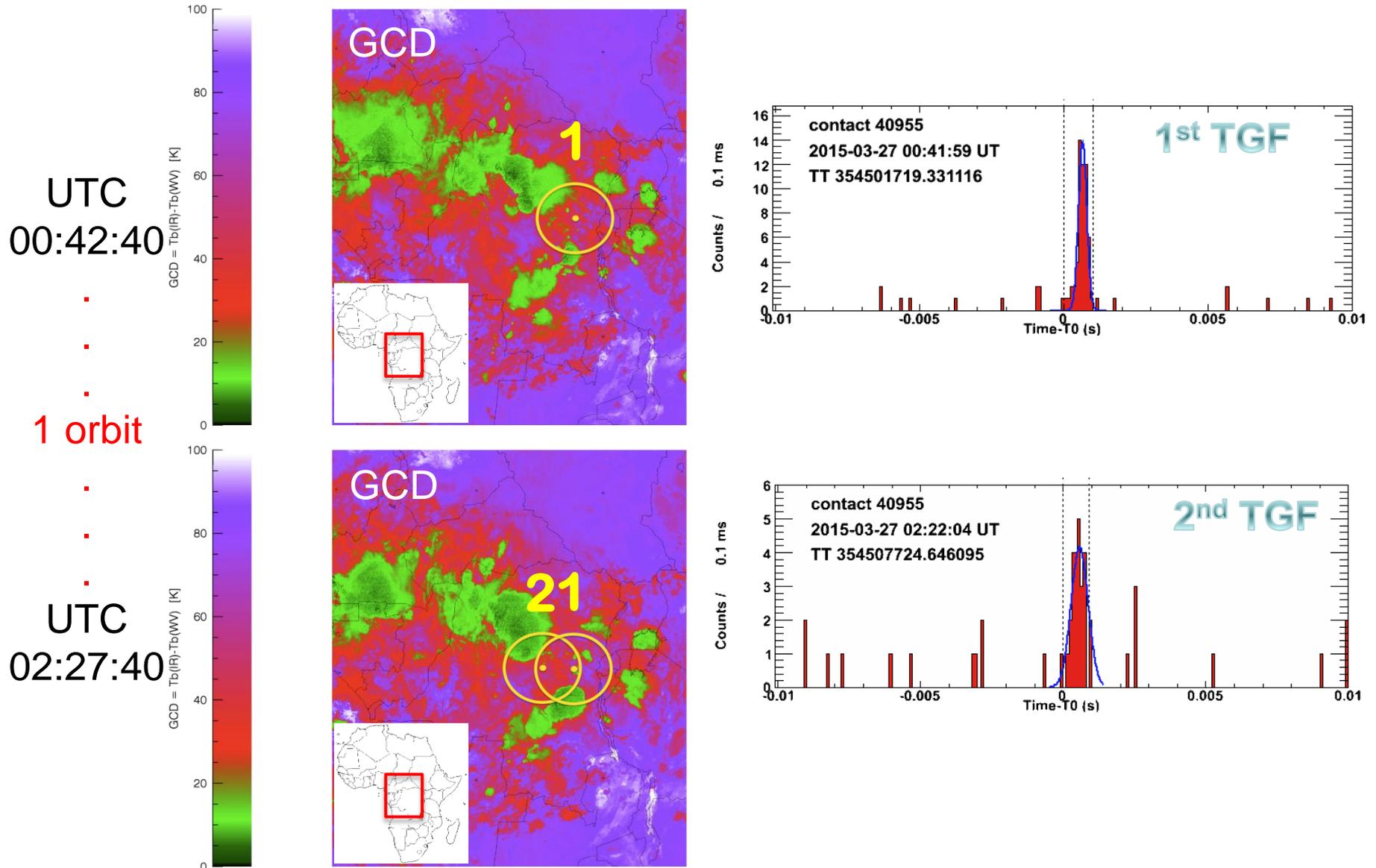
# AGILE detection of repeated TGFs from the same thunderstorms: 1

UTC  
00:42:40



(thanks to A. Argan, M. Marisaldi, A. Ursi, S. Dietrich and ISAC-CNR)

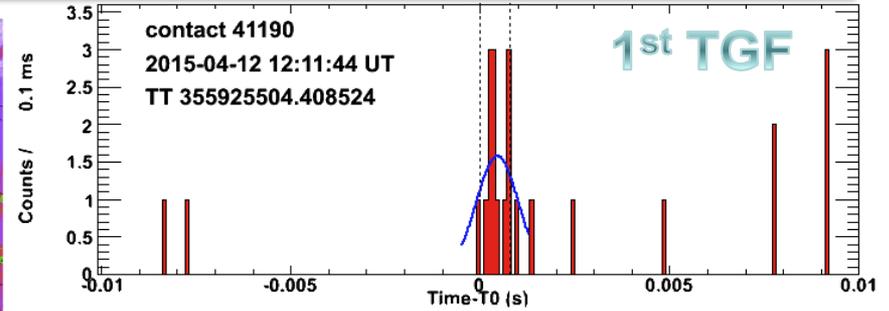
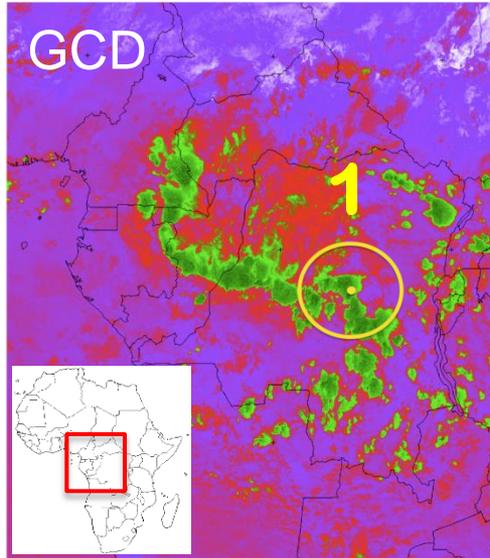
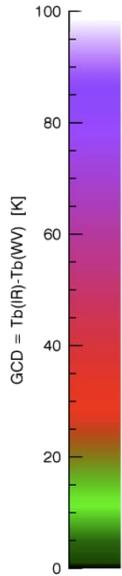
# AGILE detection of repeated TGFs from the same thunderstorms: 1



(thanks to A. Argan, M. Marisaldi, A. Ursi, S. Dietrich and ISAC-CNR)

# AGILE detection of repeated TGFs from the same thunderstorms: 2

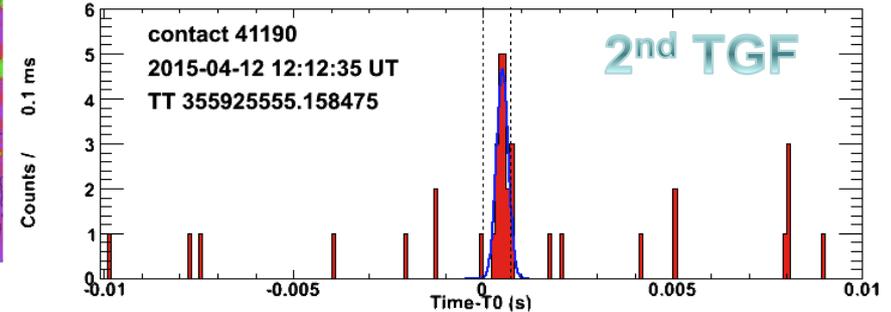
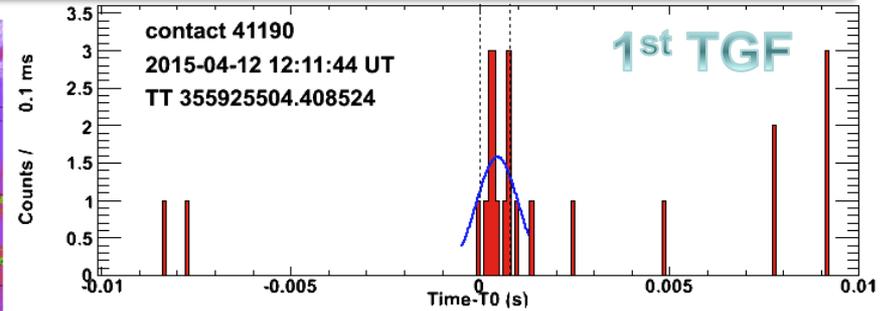
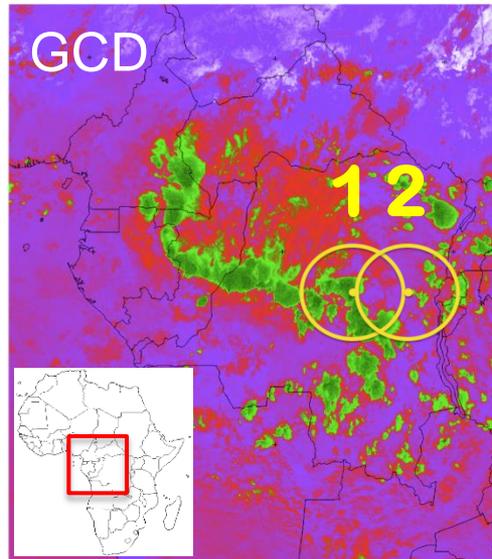
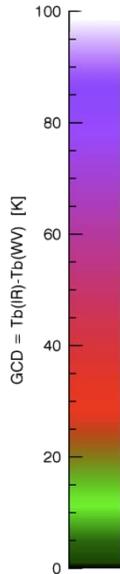
UTC  
12:12:40



(thanks to A. Argan, M. Marisaldi, A. Ursi, S. Dietrich and ISAC-CNR)

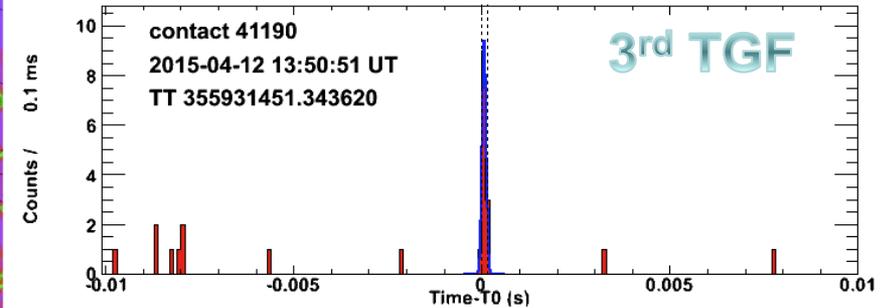
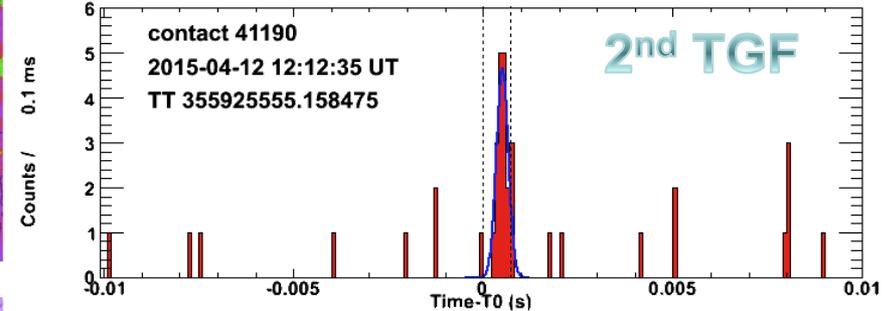
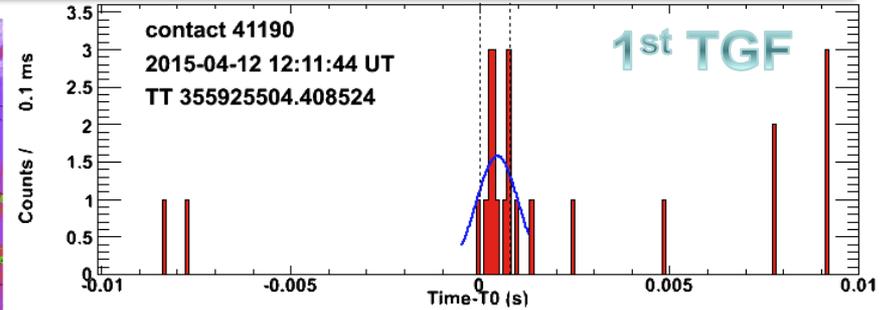
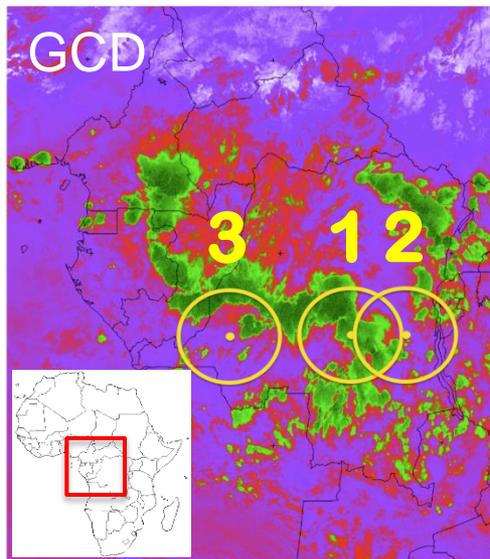
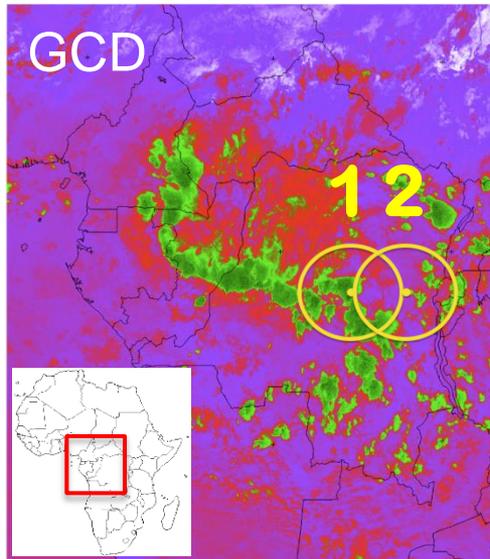
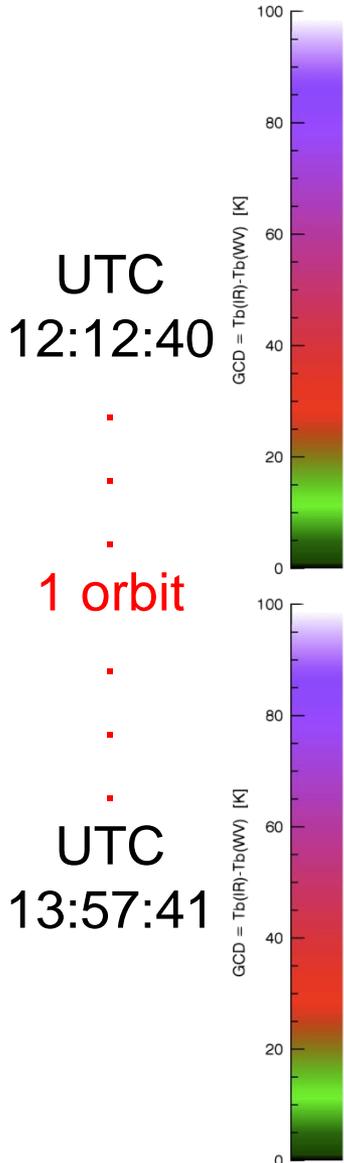
# AGILE detection of repeated TGFs from the same thunderstorms: 2

UTC  
12:12:40



(thanks to A. Argan, M. Marisaldi, A. Ursi, S. Dietrich and ISAC-CNR)

# AGILE detection of repeated TGFs from the same thunderstorms: 2

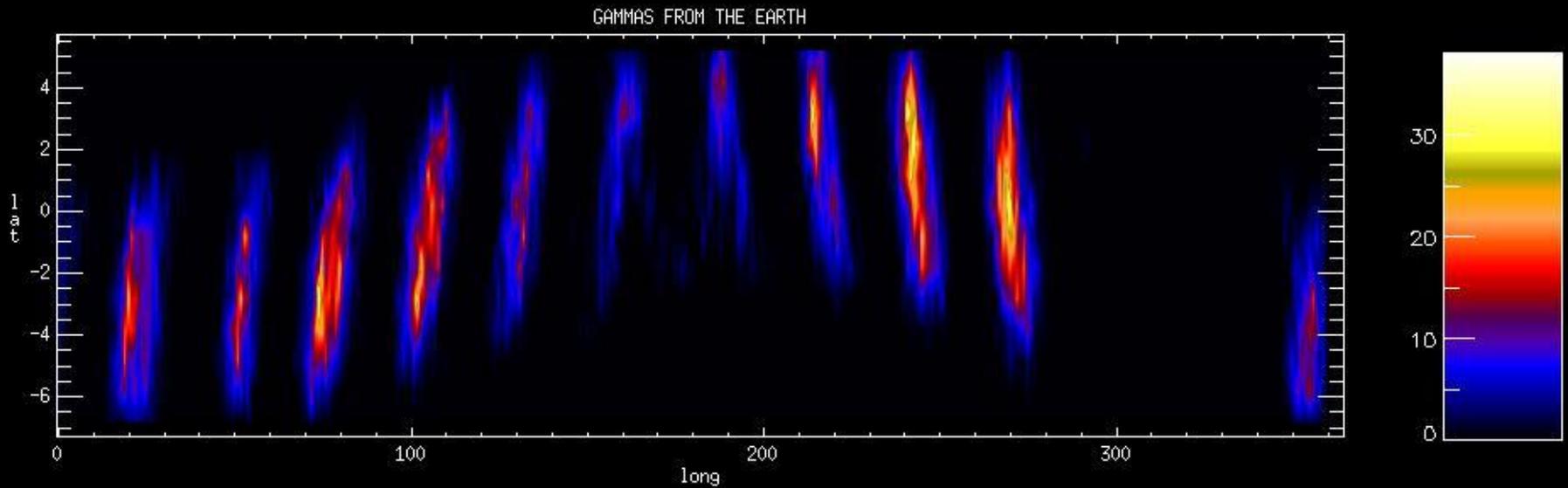


(thanks to A. Argan, M. Marisaldi, A. Ursi, S. Dietrich and ISAC-CNR)

# AGILE gamma-ray mapping of the Earth

(thanks to A. Argan, A. Trois, G. Piano, A. Ursi)

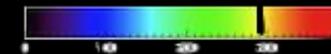
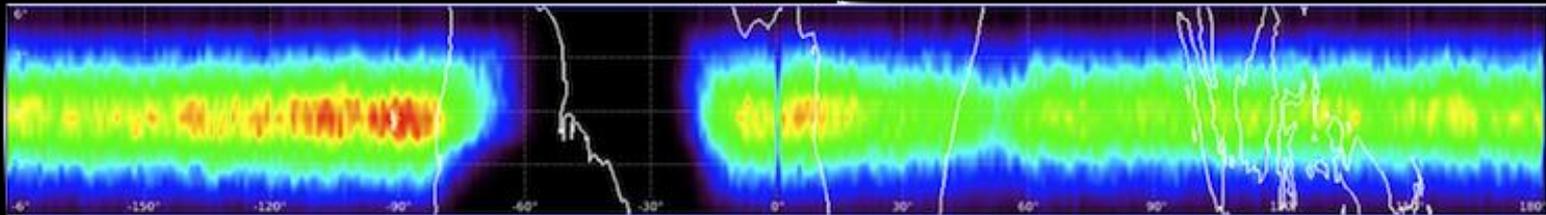
AGILE scan of the Earth per orbit



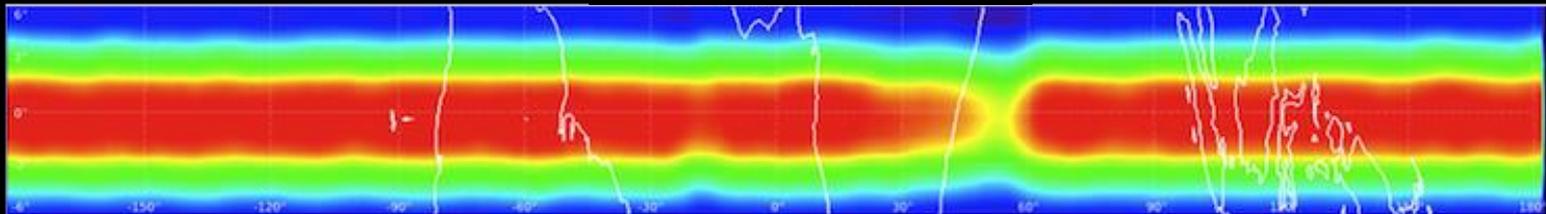
# AGILE gamma-ray mapping of the Earth

01/07/2014 ÷ 19/03/2015

counts map



exposure map

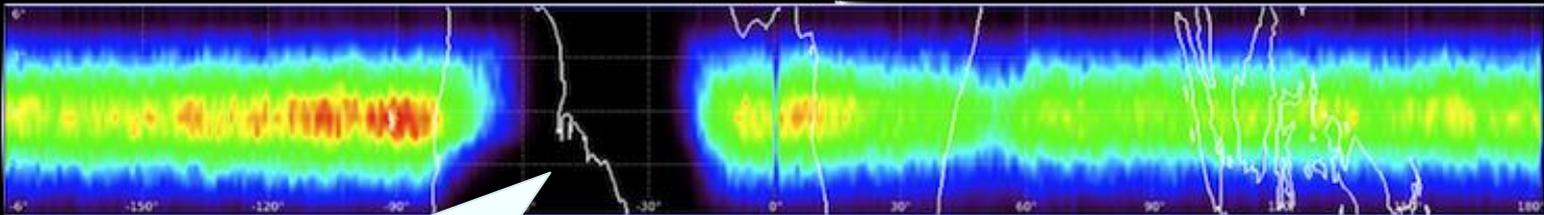


(thanks to A. Argan, A. Trois, G. Piano, A. Ursi)

# AGILE gamma-ray mapping of the Earth

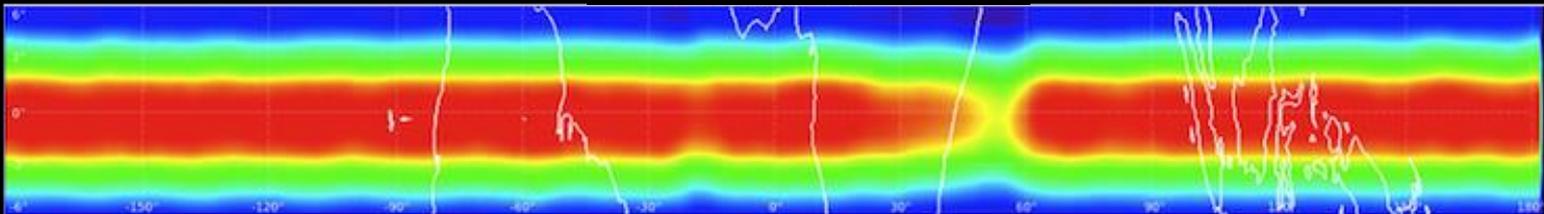
01/07/2014 ÷ 19/03/2015

counts map



South Atlantic  
Anomaly

exposure map

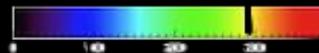
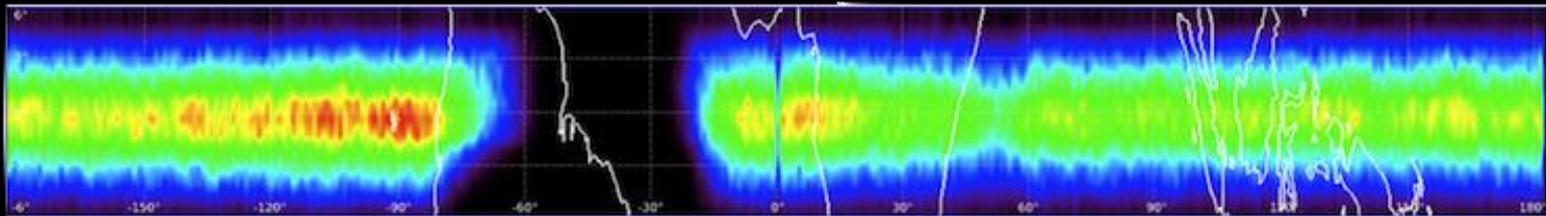


(thanks to A. Argan, A. Trois, G. Piano, A. Ursi)

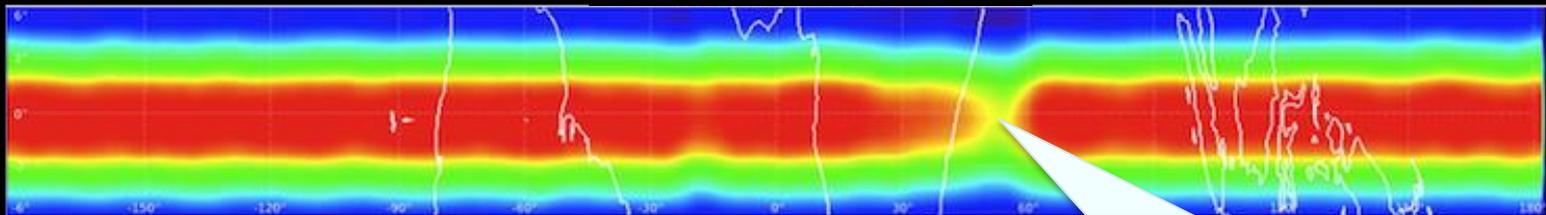
# AGILE gamma-ray mapping of the Earth

01/07/2014 ÷ 19/03/2015

counts map



exposure map



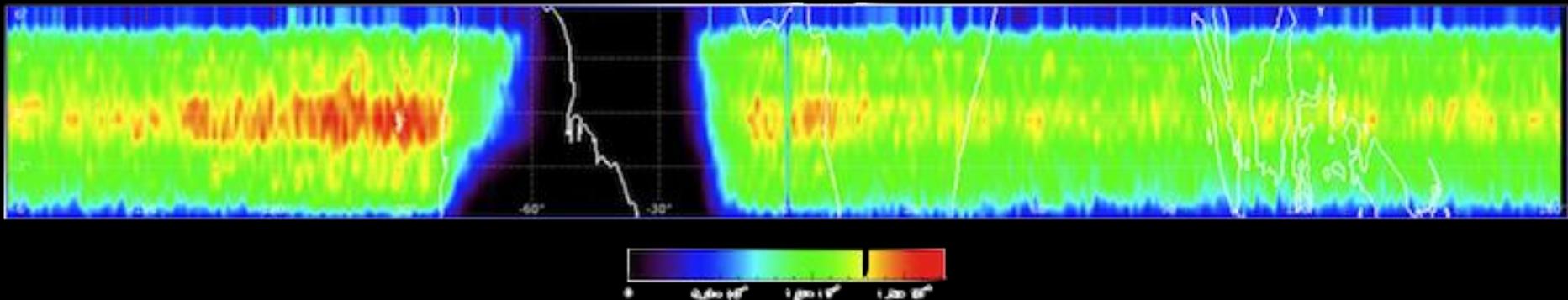
Telemetry gap  
over Malindi

(thanks to A. Argan, A. Trois, G. Piano, A. Ursi)

# AGILE gamma-ray mapping of the Earth

01/07/2014 ÷ 19/03/2015

intensity map

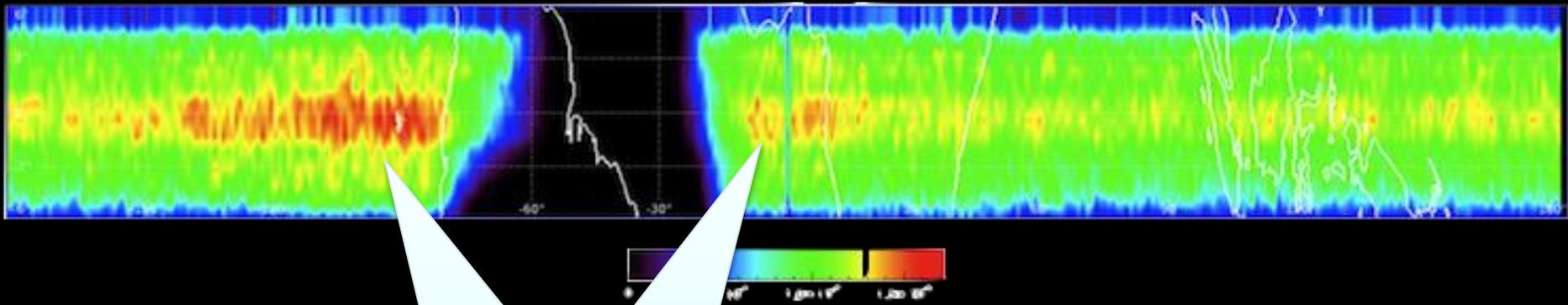


(thanks to A. Argan, A. Trois, G. Piano, A. Ursi)

# AGILE gamma-ray mapping of the Earth

01/07/2014 ÷ 19/03/2015

intensity map

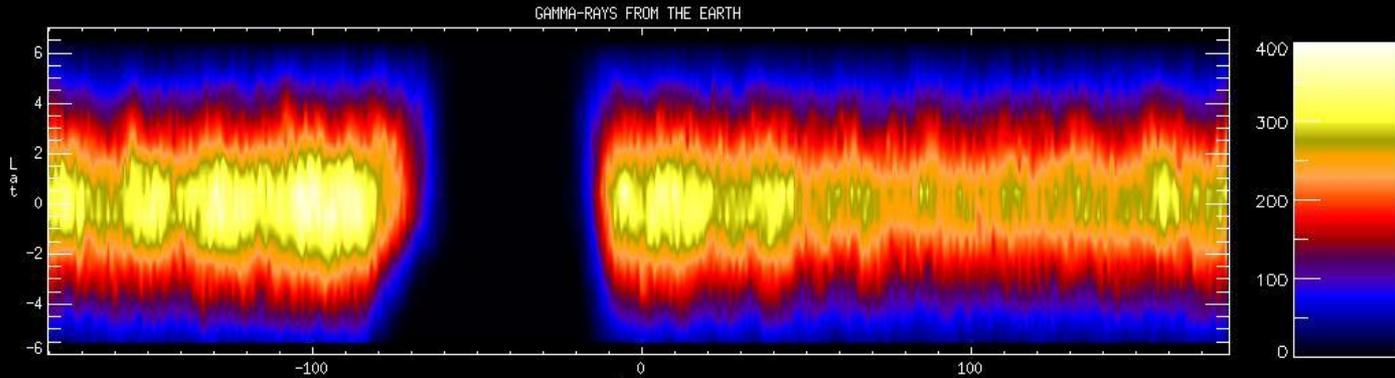


enhancement  
due to the SAA ?

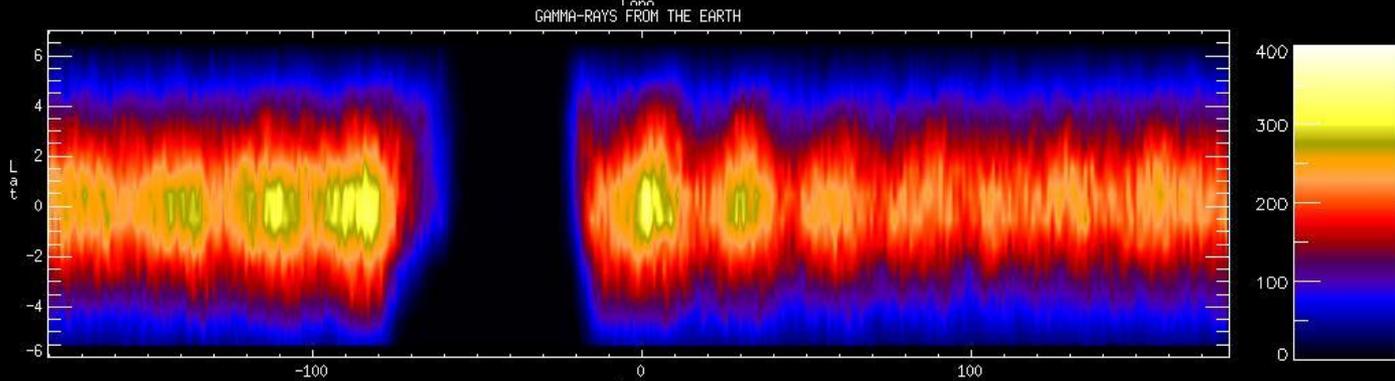
(thanks to A. Argan, A. Trois, G. Piano, A. Ursi)

# AGILE gamma-ray mapping of the Earth

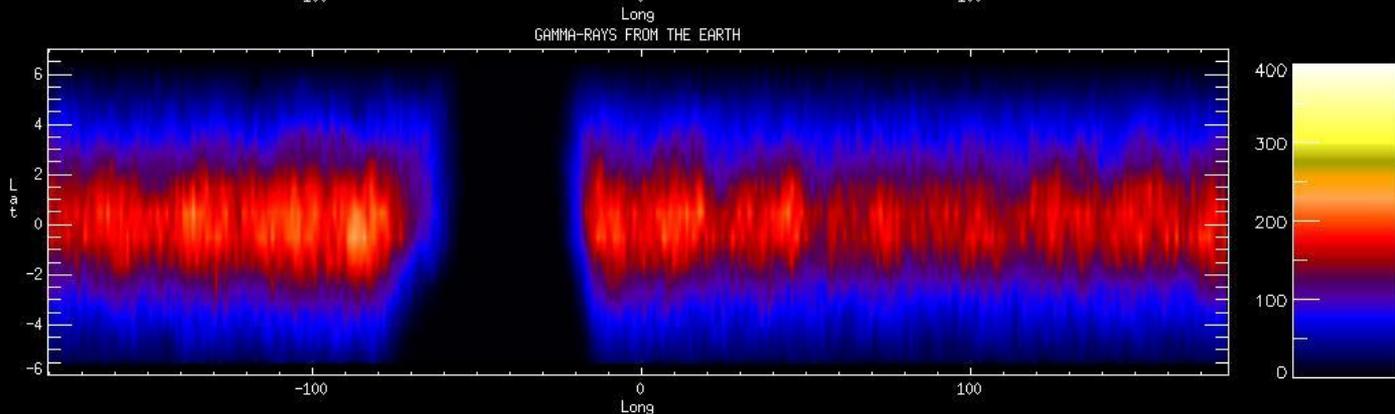
07/2014  
÷  
09/2014



10/2014  
÷  
12/2015



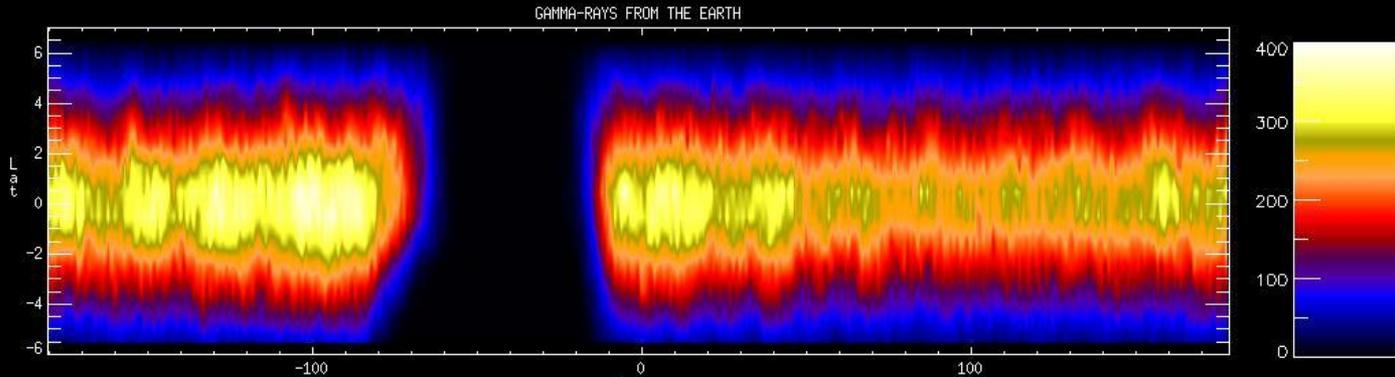
01/2015  
÷  
03/2015



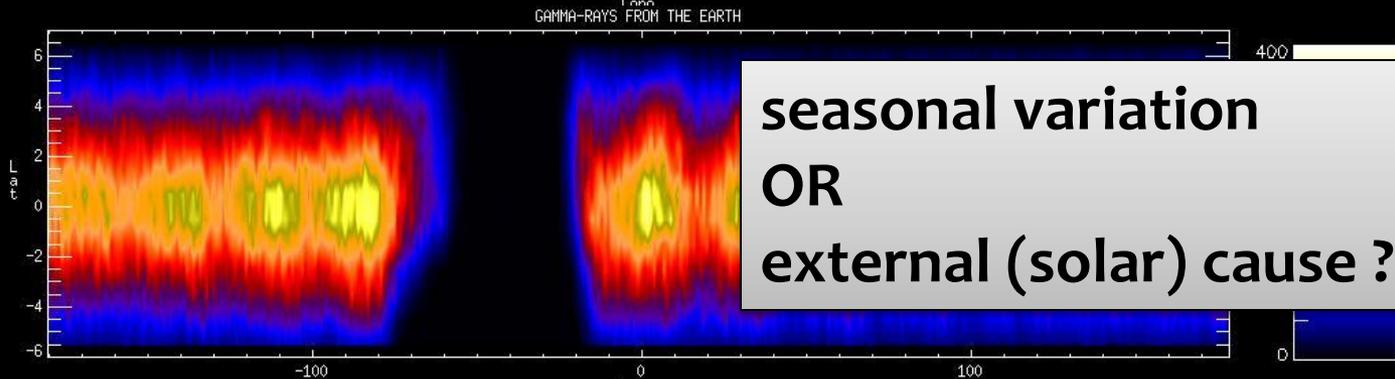
(thanks to A. Argan, A. Trois, G. Piano, A. Ursi)

# AGILE gamma-ray mapping of the Earth

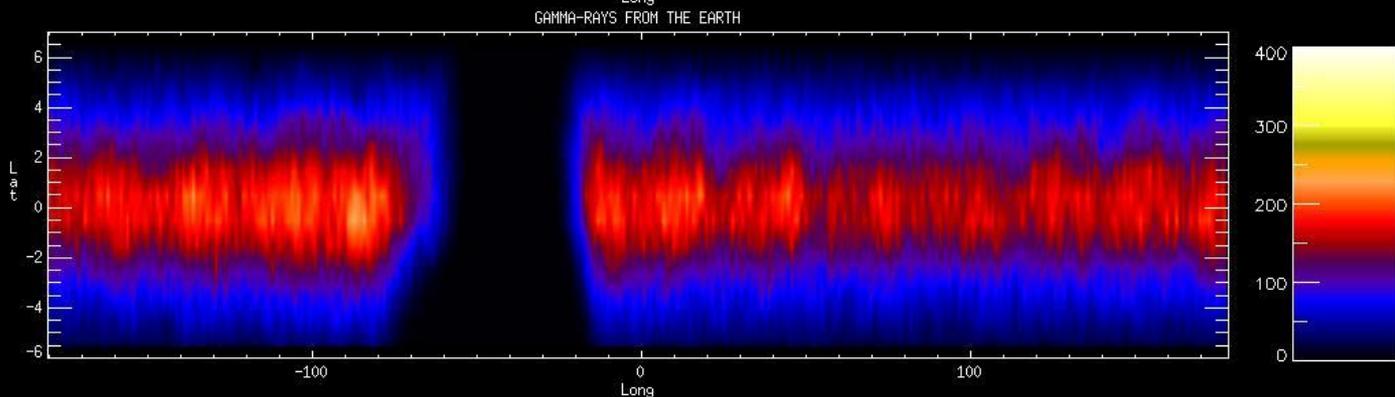
07/2014  
÷  
09/2014



10/2014  
÷  
12/2015



01/2015  
÷  
03/2015



(thanks to A. Argan, A. Trois, G. Piano, A. Ursi)

- **AGILE continues its observations of the Far-Away and the Earth with unique capabilities**
- **AGILE now in its 9th year in orbit, towards its 10th birthday...!**