

Alerts and APPs

A. Bulgarelli

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University of Modena and Reggio Emilia

on behalf of AGILE Team

11th AGILE Science Workshop May 16-17,
2013, ASI Headquarters, Rome

ALERTS?

- **Transient discoveries from gamma-ray sources** during the AGILE observations is possible given the large Field of View and the AGILE sensitivity
- **A quick reaction time** enable us to **follow the evolution of a flaring event**
- The **search for γ -ray transients (Galactic and extra-Galactic)** detectable on timescales of 1-2 days is one of the main daily activities performed by the AGILE Team

PIPELINES

- Two **independent** pipelines
 - The **Science Alert System (SAS)** pipeline running at INAF/IASF Bologna (IASFBO)
 - The **Quick-Look Scientific (QLS)** pipeline running at the AGILE Data Center (ADC)

SAS@IASFBO



QLS@ADC

Automated scientific analysis systems

Cross check of scientific results

QLS@ADC

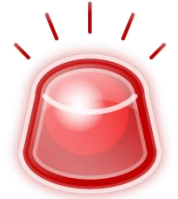
SAS@IASFBO

It performs an accurate data processing

It performs a raw data processing

It generates daily REPORTS

It generates ALERTS immediatly



It works with a **continuous integration of data**: the data are analyzed for each orbit

QLS@ADC

Agile Services: user bulgarelli





[Pipeline Services Back to home page](#)

Session	View Log Files	Tools
Logout Change Password, e-mail	TM Preprocessing Auxillary Pipeline Correction Pipeline Quicklook Standard Pipeline Interactive Quicklook Pipeline Quicklook Incremental Pipeline Quicklook Variability Pipeline Standard Pipeline	View Pipeline Status Process View

From: no_reply@asdc.asi.it Hide
 Subject: [gridalert] AGILE Daily Report Global Proc. 03/11/2012 noon (ok) Inbox - IASFCO
 Date: 03 novembre 2012 19:47:08 GMT+01:00
 To: Marco Tavani, gridalert@iasfbo.inaf.it, Giorgio Fanari

AGILE Daily Report Global Proc. 03/11/2012 noon (MJD:56234) ##
 ### FM Filter -----
 A) High Latitude: -1st selection lxsnr>2.2&srqtts>2.91 ##

AGILE NAME	LII	BII	StartDate	EndDate	MLFlux	XimSNR	srqt(TS)	Other name	IAGL NAME	BZCAT
NAME	(degree)	(degree)			(E-8ph/cm^2s)					

AGLJ0543-1544	219.876	-22.068	2012-11-01T11:50	11-03	305.4	2.52	3.9	---	---	---
AGLJ0816+0922	213.997	22.974	2012-11-01T11:50	11-03	180.7	2.97	3.3	BZBJ0814+0856	---	BZBJ0814+0856
AGLJ0818+0934	214.067	23.559	2012-11-01T11:50	11-03	161.1	3.00	3.3	---	---	BZBJ0814+0856
AGLJ1005+7936	131.306	34.649	2012-11-01T11:50	11-03	95.7	3.00	3.3	---	---	---
AGLJ1034+4255	174.317	58.007	2012-11-01T11:50	11-03	136.3	2.35	3.0	SDSSJ103317.94+	---	BZBJ1033+4222
AGLJ1625+8140	115.053	31.877	2012-11-01T11:50	11-03	164.2	2.35	2.9	NGC6251	---	BZUJ1632+8232
AGLJ2108+3119	76.816	-10.874	2012-11-01T11:50	11-03	164.1	2.85	3.6	---	---	---
AGLJ2152-8212	309.463	-32.496	2012-11-01T11:50	11-03	86.8	3.15	3.1	---	---	BZQJ2202-8338
AGLJ2240+7609	115.198	15.287	2012-11-01T11:50	11-03	243.2	3.00	2.9	---	---	---
-2nd selection lsrqtts>3.7&exclude:xsnr>2.21										
AGLJ0537-1553	219.410	-23.465	2012-11-01T11:50	11-03	296.1	1.97	4.2	---	---	---
B) Galactic Plane (Low Latitude): -1st selection lxsnr>3&srqtts>2.1 ##										
AGLJ0636+1803	195.099	4.803	2012-11-01T11:50	11-03	430.7	4.18	4.9	GEMINGA	1AGLJ0634+17	---
AGLJ0750-2649	243.181	-0.350	2012-11-01T11:50	11-03	159.9	3.56	3.3	---	---	---
AGLJ0835-4515	263.623	-2.814	2012-11-01T11:50	11-03	874.5	8.35	11.1	VelaPSR	1AGLJ0835-45	---
AGLJ0954-6123	283.289	-5.461	2012-11-01T11:50	11-03	241.1	3.15	2.0	---	---	---
AGLJ1317-6308	305.812	-0.406	2012-11-01T11:50	11-03	464.3	3.82	2.6	---	---	---
AGLJ1715-3820	348.621	0.181	2012-11-01T11:50	11-03	640.2	3.15	2.2	---	---	---
AGLJ1740-3155	356.853	-0.570	2012-11-01T11:50	11-03	590.1	3.15	2.2	---	1AGLJ1736-32	---
AGLJ1825-1417	17.295	-0.749	2012-11-01T11:50	11-03	323.5	5.02	3.5	---	1AGLJ1824-14	---
AGLJ1851-0009	32.781	-0.048	2012-11-01T11:50	11-03	445.9	5.48	2.0	---	---	---
AGLJ1853+0336	36.368	1.190	2012-11-01T11:50	11-03	470.3	5.57	2.5	---	---	---
AGLJ1956+3309	69.377	2.330	2012-11-01T11:50	11-03	312.2	4.06	2.3	---	---	---
AGLJ2019+3728	75.436	0.876	2012-11-01T11:50	11-03	223.5	4.82	3.2	PSRJ2021+3651	1AGLJ2021+36	---
-2nd selection lsrqtts>3.&exclude:xsnr>31										
AGLJ0703-0220	216.300	1.451	2012-11-01T11:50	11-03	166.6	2.52	3.3	---	---	---

FT3ab Filter -----
 B) Galactic Plane (Low Latitude): -1st selection lxsnr>2.2&srqtts>2.91 ##
 No entries retrieved

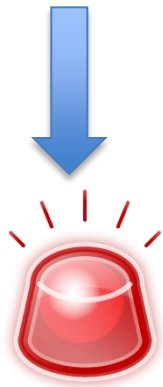
AGILE services

Daily REPORTS

SAS@IASFBO

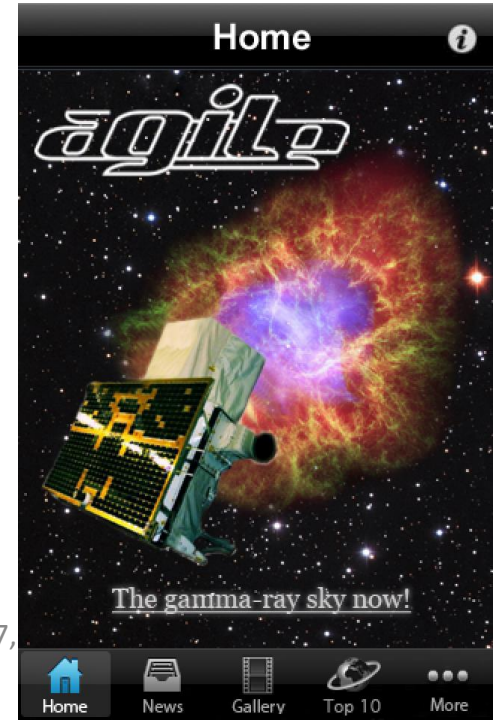
ALERTS & APPS

Science Alert System

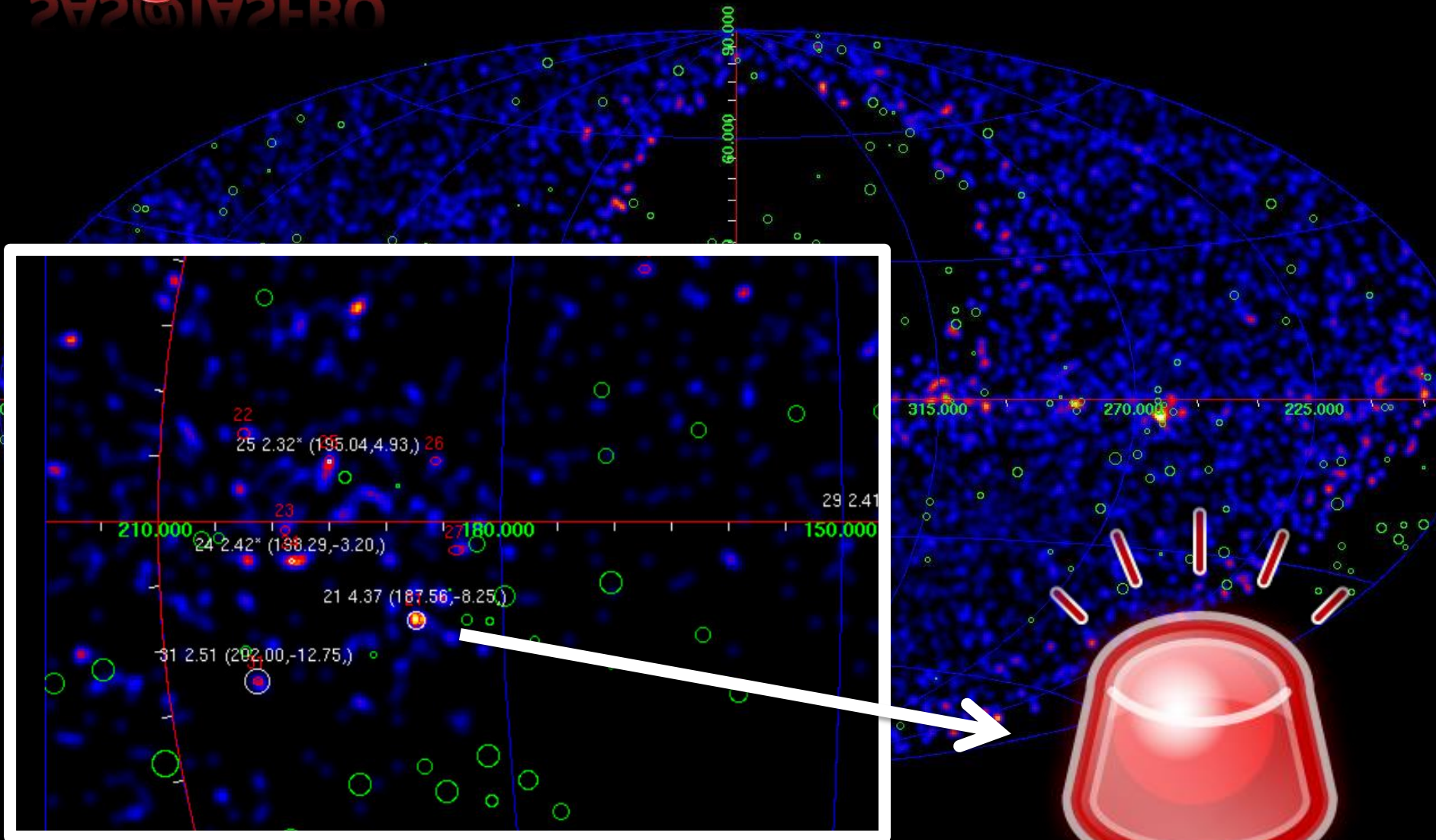


To react in the shortest time

To access the results with a mobile phone



SAS@IASFBO



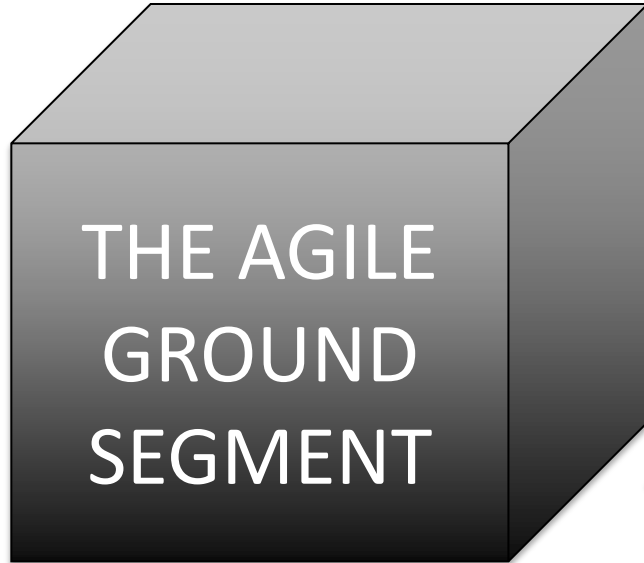
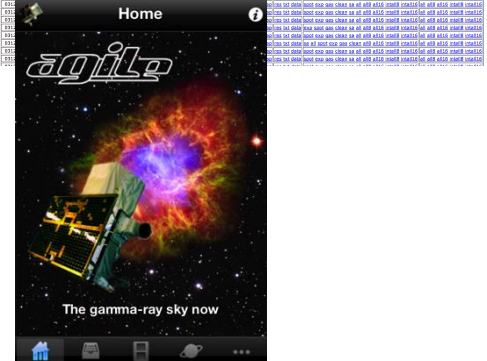
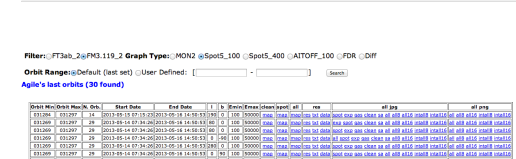
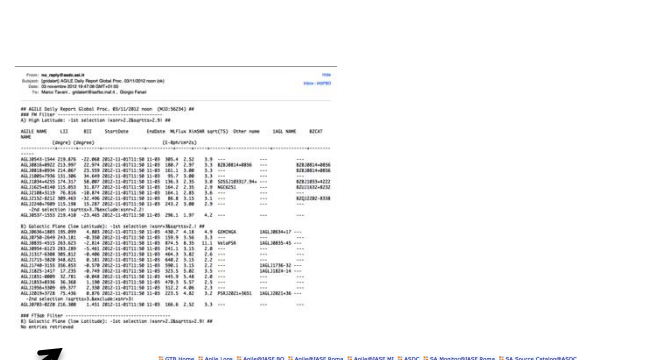
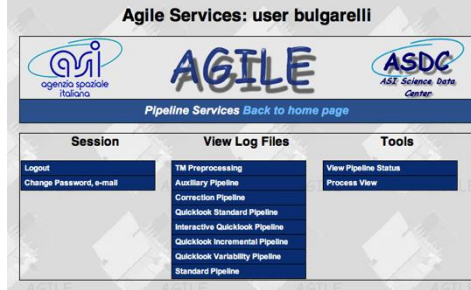
SAS@IASFBO



ALERTS within 2-3 hours!



THE FASTEST GAMMA-RAY GROUND SEGMENT OF THE WORLD



Who is involved?



INAF - IASF BOLOGNA

ISTITUTO DI ASTROFISICA SPAZIALE
E FISICA COSMICA - BOLOGNA



AGILE



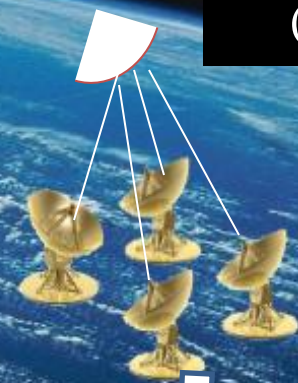
INTELSAT



Telespazio
@ Fucino
(Italy)



Malindi
(Kenya)

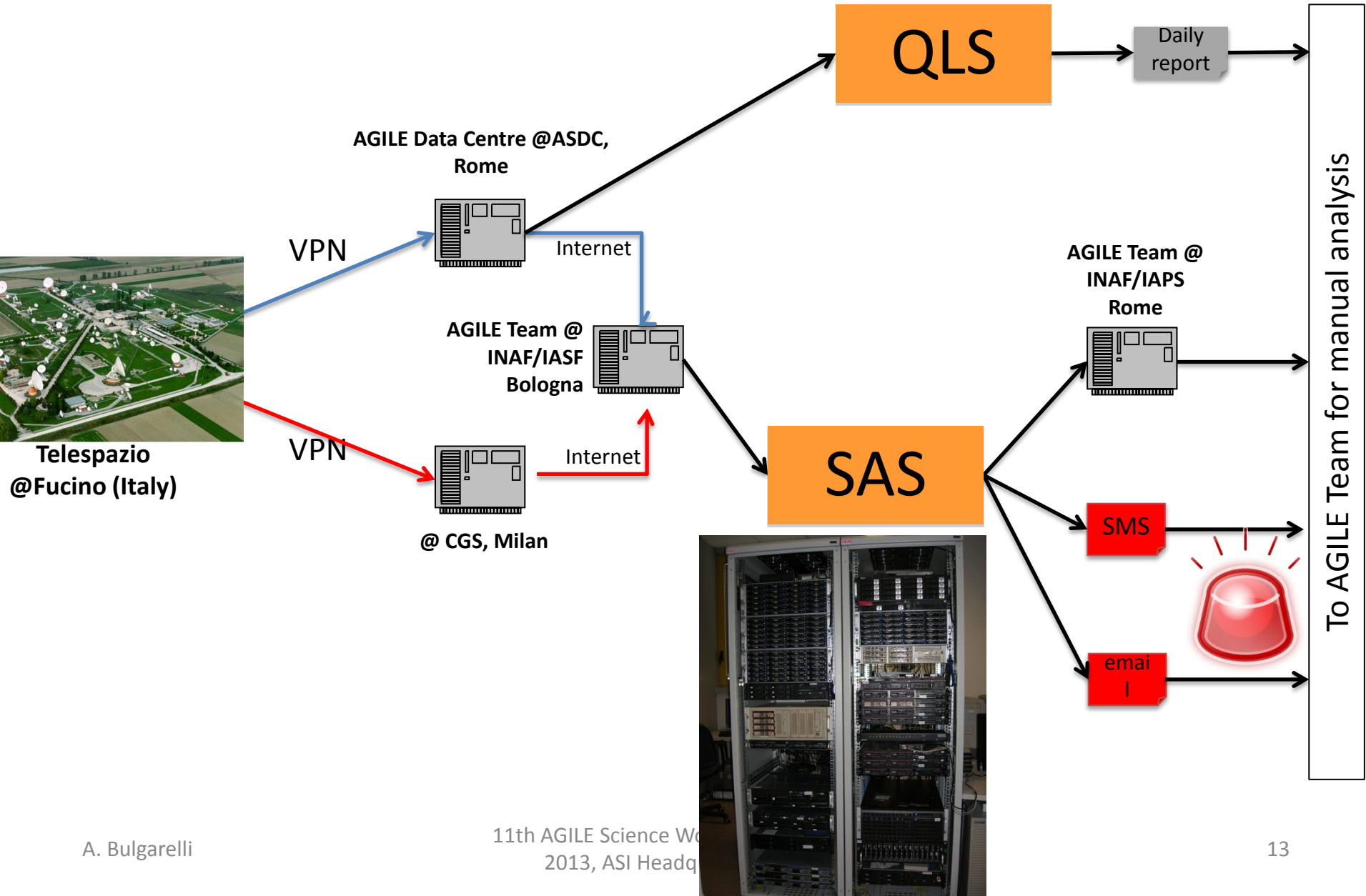


To AGILE
Collaboration

Every 96 minutes...

➡ Nominal chain, L0 (raw), L1 (FITS) and auxiliary data flow

➡ Backup chain, L0 (raw) data flow (manual)



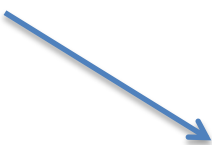
```

From: no_reply@iasfbo.it
Subject: [gridalert] AGILE Daily Report Global Proc. 03/11/2012 noon (MD:156234) #
Date: 03 novembre 2012 18:49 GMT+01:00
To: Marco Taverni, gridalert@iasfbo.it, Giorgio Farusi

## AGILE Daily Report Global Proc. 03/11/2012 noon (MD:156234) ##
## IM Filter
A) High Latitude: -1st selection ixsmn=2.Z8sgrts=2.9I ##

AGILE NAME LII BII StartDate EndDate MLFlux XlnSMR src(Ts) Other name IAGL NAME BZCAT
-----
(degpr) (degpr) (-----)
-----
AGL30843-1544 219.876 -22.008 2012-11-01T11:50 11-03 385.4 2.52 3.9 ---
AGL30816-8922 213.997 22.974 2012-11-01T11:50 11-03 180.7 2.97 3.3 BZ8J0814-0856 ---
AGL30838-0934 214.067 23.550 2012-11-01T11:50 11-03 161.1 3.00 3.1 ---
AGL31050-1756 131.386 34.640 2012-11-01T11:50 11-03 25.7 3.00 3.1 ---
AGL31034-4235 174.317 34.007 2012-11-01T11:50 11-03 136.3 2.35 3.0 S0552193317-54 ---
AGL31052-1140 115.853 31.877 2012-11-01T11:50 11-03 166.2 2.25 2.9 MG0241 ---
AGL31288-3119 76.816 -10.874 2012-11-01T11:50 11-03 164.1 2.45 3.6 ---
AGL31232-8212 389.463 -32.456 2012-11-01T11:50 11-03 86.8 3.15 3.1 ---
AGL32240-7009 115.198 15.287 2012-11-01T11:50 11-03 243.2 3.00 2.9 ---
-2nd selection !sgprts=3.Mexclude:ixsmn=2.I
AGL30537-1553 219.418 -23.465 2012-11-01T11:50 11-03 296.1 1.97 4.2 ---
-----
B) Galactic Plane (low Latitude): -1st selection ixsmn=3Aggrts=2.I #
AGL30836-1803 195.899 4.403 2012-11-01T11:50 11-03 430.7 4.18 4.9 GCMNCA IAGL30834-17 ---
AGL30750-2649 243.181 -0.350 2012-11-01T11:50 11-03 159.9 3.56 3.3 ---
AGL30835-4515 283.023 -2.814 2012-11-01T11:50 11-03 874.9 8.35 11.1 VelopR IAGL30835-45 ---
AGL30564-0123 283.089 -5.461 2012-11-01T11:50 11-03 743.1 3.15 2.8 ---
AGL31117-6388 385.812 -0.480 2012-11-01T11:50 11-03 464.3 3.82 2.6 ---
AGL31215-3830 348.021 0.183 2012-11-01T11:50 11-03 640.2 3.15 2.2 ---
AGL31740-3155 356.853 -0.570 2012-11-01T11:50 11-03 590.1 3.15 2.2 ---
AGL31825-1417 17.035 -0.740 2012-11-01T11:50 11-03 323.5 5.82 3.5 ---
AGL31851-0009 32.781 -0.044 2012-11-01T11:50 11-03 445.9 5.48 2.8 ---
AGL31833-0136 30.369 1.190 2012-11-01T11:50 11-03 479.9 5.27 2.5 ---
AGL31956-1309 69.377 2.330 2012-11-01T11:50 11-03 312.2 4.06 2.3 ---
AGL32039-0718 75.436 0.870 2012-11-01T11:50 11-03 223.5 4.82 3.2 P98J2021-3651 IAGL32021-36 ---
-2nd selection !sgprts=1.Mexclude:ixsmn=3I
AGL30703-0220 216.300 1.451 2012-11-01T11:50 11-03 166.6 2.52 3.3 ---
-----
## FT3db Filter
## Galactic Plane (low Latitude): -1st selection ixsmn=2.Z8sgrts=2.9I ##
No entries retrieved

```



```

-----
Uranian CRIDS BII: [gridalert] ALERT LEVEL 4.23 202.9 / -79.5 (237.7, 152.5, 311) - FM3.119.2.SPOTS.2. #
Uranian CRIDS BII: [gridalert] ALERT LEVEL 4.23 202.9 / -79.5 (237.7, 152.5, 311) - FM3.119.2.SPOTS.2. #
-----
Da: Uranian CRIDS BUILD17-epd1.17@iasfbo.it
Oggetto: [gridalert] ALERT LEVEL 4.8 202.7+/-77.5 (86.2, 15.7, 620) - 14 - FM3.119.2.SPOTS.100.023467.023468.B00070EXT.010.td
Date: 11 novembre 2012 19:21:34 GMT+01:00
A: gridalert@iasfbo.it, aggrt@iasfbo.it, aggrt@iasfbo.it

4.00 98.1943 15.717 off axis 23.87 exp 622.426
I X: sgr(Ts), l, b, Counts, Err, Flux, Err
14 3.9952 98.1943 15.717 17.1454 6.55578 2.62722e-06 7.75133e-07 23.87

@23457.023464.FM3.119.2.SPOTS.0001.Csm2ns100101rr@.7.spotlist.multiple.step2.muti.res
Inq:
http://gpb.iasfbo.inaf.it/smdst3/FM3.119.2.SPOTS.100.SPOT/023457.023464.0205770/023457.023464.0205770.Csm2ns100101rr@.7.all.png
Outdir: http://gpb.iasfbo.inaf.it/smdst3/FM3.119.2.SPOTS.100.SPOT/023457.023464.0205770/

SMDM3: http://simbad.u-strasbg.fr/simbad/sim-coo?
CoordLineFrames=moonCoordPos=2000Coord=19193015.717submit=submit%3BqueryRadius.unit=arcminCoordGui=2000CoordFrame=GalRadius=5@8

WD: http://nedwww.ipac.caltech.edu/cgi-bin/nvo-q/selector?
in_cygs-galacticid.in_sou=2000_0&lon=98.1943&lat=15.717&radius=698&search_type=Near&PositionsSearchOut_cygs=autoradiout_soulo
on=2000_0&obj_sort=distancetosearchcenter&of=grv_text&breaker=30000_0&list_line=5&img_stamp=15&const=not-inconstrain@n
z.unit=1&unit=2&unit=3&unit=4&unit=5&include=onlyTemp_objonly

!!!!!!!!!!!!!!
14.muti
!!!!!!!!!!!!!!
i-ctrllogs/AGM.cat
i-ctrllogs/integral.cat

```

[gridalert] ALERT LEVEL
 4.86 512.0+/-148.6 (79.5,
 1.8, 201) - 23 -
 FM3.119.2.SPOTS.100.02
 3439.023467.B2EXT.002.tx
 t

10/nov/2011 18:27
 [gridalert] ALERT LEVEL
 4.95 386.7+/-136.6 (195.6,
 4.6, 105) -
 1AGL_J0634+1748 -
 FM3.119.2.SPOTS.100.02
 3442.023469.B6EXT.002.tx
 t

A manual analysis starts
 when an alert is generated
 above a well defined
 threshold (with $v(Ts) \geq 4.5$)



IASFMI



Who is involved?

A. Bulgarelli

11th AOILE Science Workshop May 16-17, 2013, ASI Headquarters, Rome

The key point of the overall system: the AGILE Team can start with the manual analysis within 2-3 hours (SAS@IASFBO)

During this “quick-look” analysis the data are consolidated by a more accurate data processing (QLS@ADC)

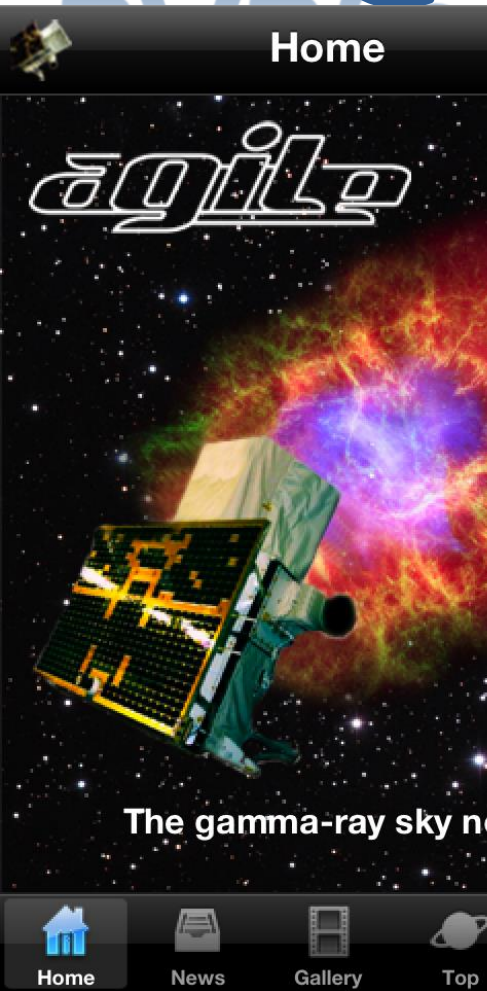


Both pipelines work with a common goal → to produce scientific results in the shortest possible time and with the best quality of data

SAS@IAS

APP

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The gamma-ray sky n

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2013/04/17
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Nebul

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Position

W: 31.46 N: -1.34



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Position

AT Reserved

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Monitoring

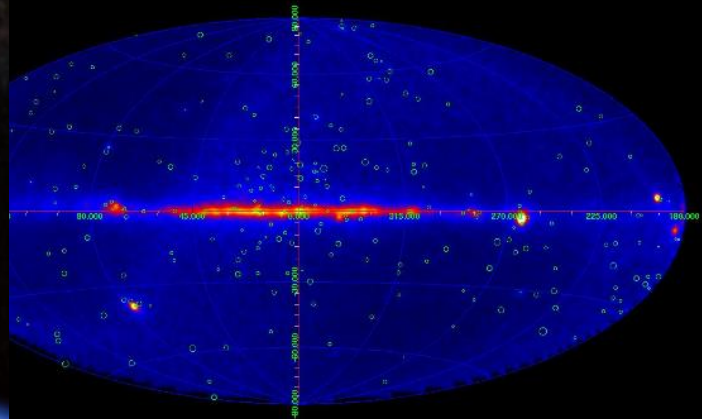
AITOFF

DB Query

AT Reserved AITOFF ↻

2d 4d 7d 1y

013072.031158.A11



A. Bulgarelli

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Daily Fov

Efficiency

Acquired gamma

QLS@ADC

Event time

Data Quality (historical)

FM3.119_2.SPOT5_100_B1

FM3.119_2.SPOT5_100_B2

SAS@IASFBO

FM3.119_2.SPOT5_100_B3



Home

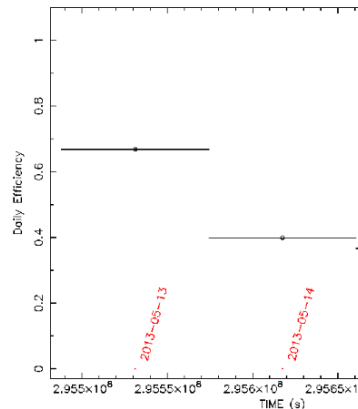
News

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Daily Efficiency (only for holas>1000.s)
Date Interval: 2013-05-12 04:30:01 -- 2013-05-16 06:00:01

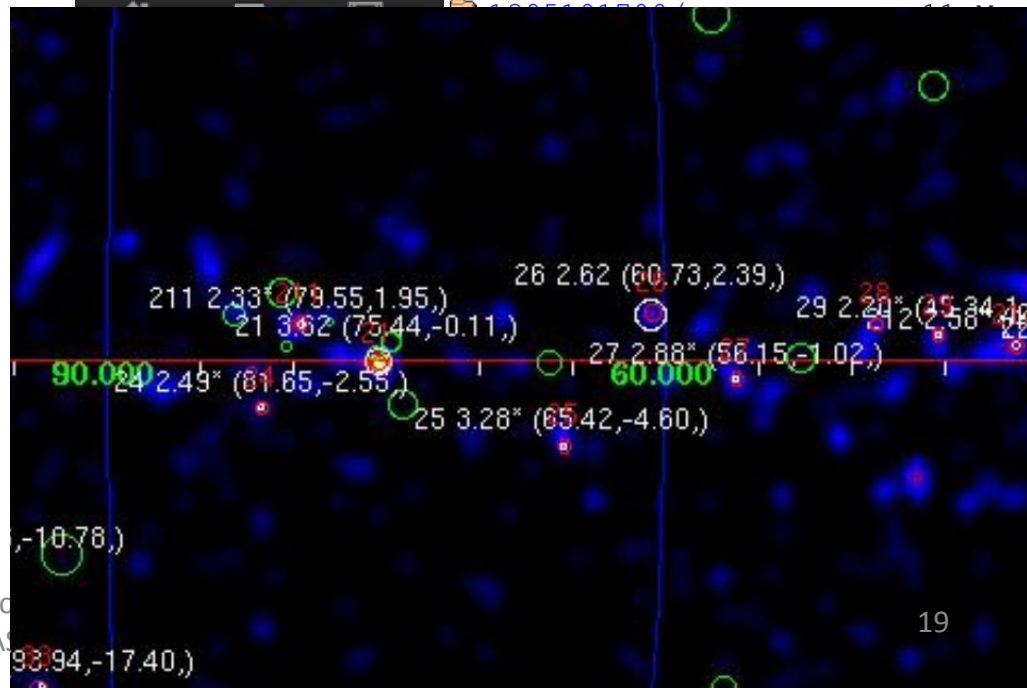


QLS@ADC



Back

Name	Last modified
Parent Directory	
last/	16-May-2
1305160500/	16-May-2
1305151700/	16-May-2
1305150500/	15-May-2
1305141700/	15-May-2
1305140500/	14-May-2
1305131700/	14-May-2
1305130500/	13-May-2
1305121700/	13-May-2
1305120500/	12-May-2
1305111700/	12-May-2
1305110500/	11-May-2



SAS@IASFBO

APP

For the first time

- An App is integrated into a scientific ground segment
- The App is used for scientific activities

In addition

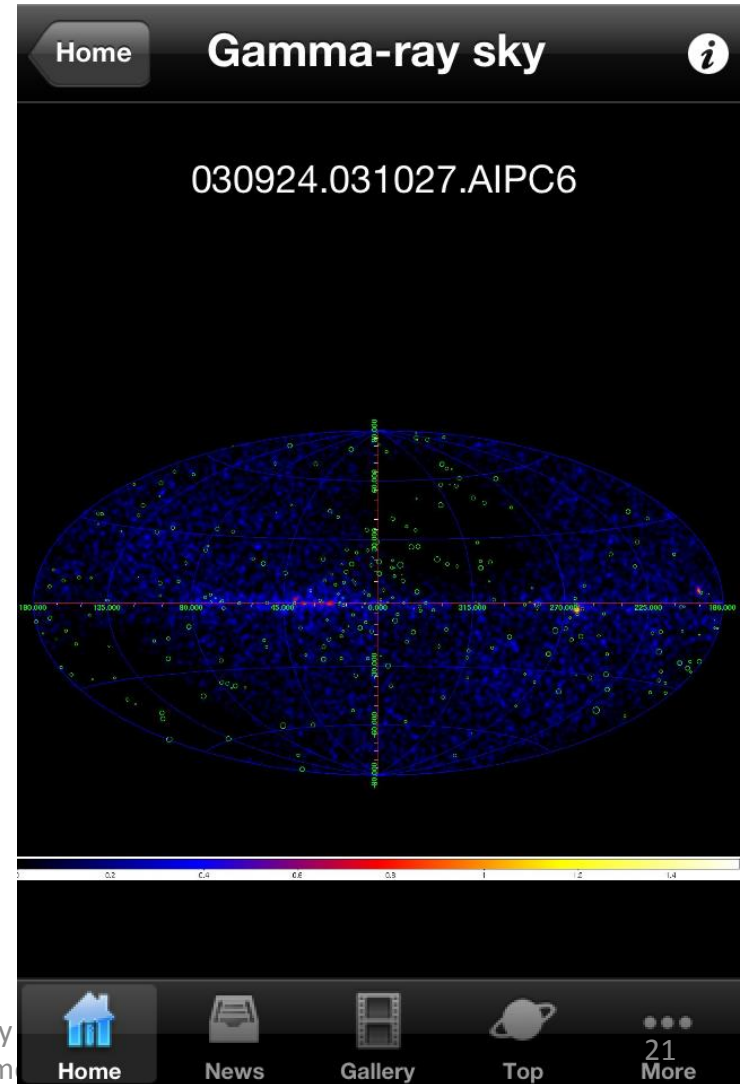
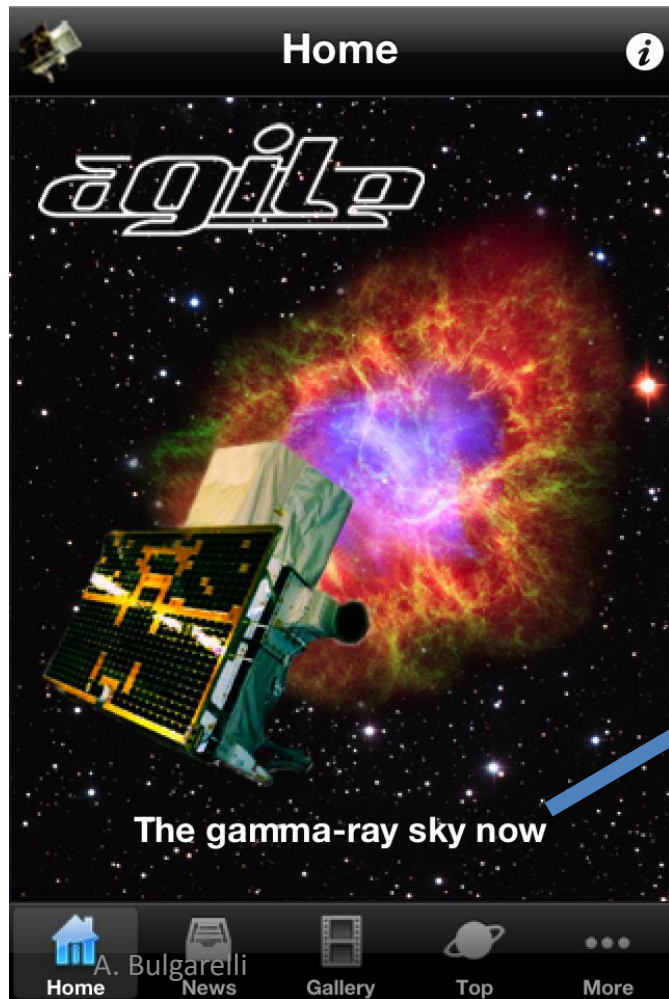
- Some step of the monitoring activities become 'mobile'



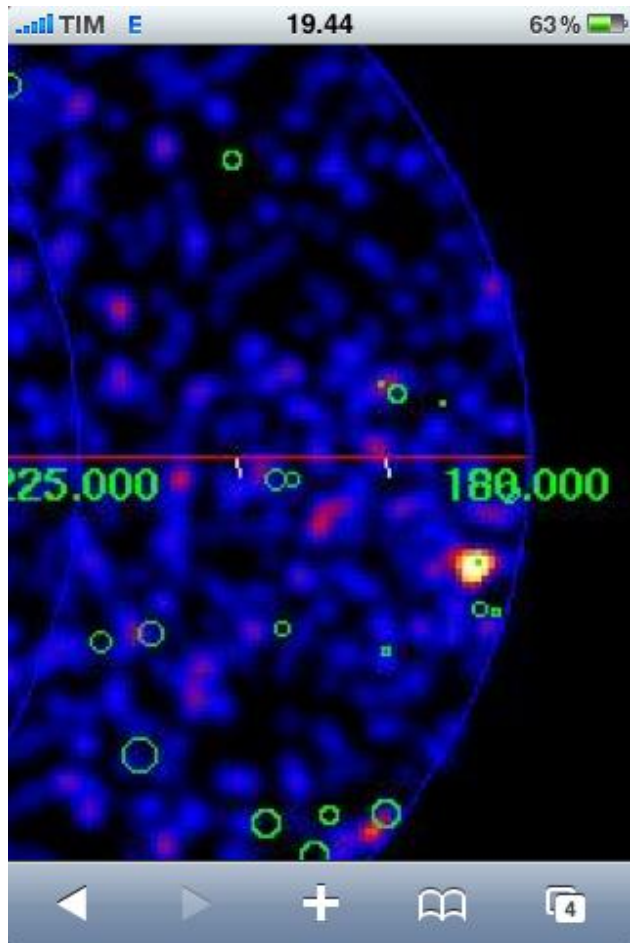
SAS@IASFBO

Put all together!

APP



11th AGILE Science Workshop May 2013, ASI Headquarters, Rom



"AGILE: from Black Holes to the Earth"

AGILE is a satellite of the Italian Space Agency (ASI) dedicated to unveiling the most exciting mysteries of our Universe. Black holes, neutron stars, stellar explosions, very far galaxies from deep space and other exotic cosmic sources emit very radiation (gamma-rays) that A detect in orbit.

Launched in 2007, the satellite observing the Universe with m

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[Agile@IASF MI](#)
[ASDC](#)
[SA Monitor@IASF Roma](#)
[SA Source Catalog@](#)



**SCIENCE MONITORING
on the WEB**

Filter: FT3ab_2 FM3.119_2 **Graph Type:** MON2 Spot5_100 Spot5_400 AITOFF_100 FDR Diff

Orbit Range: Default (last set) User Defined: [-]

Agile's last orbits (30 found)

Orbit Min	Orbit Max	N. Orb.	Start Date	End Date	l	b	Emin	Emax	clean	spot	all	res	all jpg
031264	031297	14	2013-05-15 07:15:23	2013-05-16 14:50:53	190	0	100	50000	map	map	map	res txt data	spot exp gas clean sa all all8 all16 intall8
031269	031297	29	2013-05-14 07:34:26	2013-05-16 14:50:53	80	0	100	50000	map	map	map	res txt data	spot exp gas clean sa all all8 all16 intall8
031269	031297	29	2013-05-14 07:34:26	2013-05-16 14:50:53	80	0	100	50000	map	map	map	res txt data	spot exp gas clean sa all all8 all16 intall8
031269	031297	29	2013-05-14 07:34:26	2013-05-16 14:50:53	0	-90	100	50000	map	map	map	res txt data	all spot exp gas clean sa all8 all16 intall8
031269	031297	29	2013-05-14 07:34:26	2013-05-16 14:50:53	280	0	100	50000	map	map	map	res txt data	spot exp gas clean sa all all8 all16 intall8
031269	031297	29	2013-05-14 07:34:26	2013-05-16 14:50:53	0	90	100	50000	map	map	map	res txt data	spot exp gas clean sa all all8 all16 intall8
031269	031297	29	2013-05-14 07:34:26	2013-05-16 14:50:53	160	0	100	50000	map	map	map	res txt data	spot exp gas clean sa all all8 all16 intall8
031269	031297	29	2013-05-14 07:34:26	2013-05-16 14:50:53	0	0	100	50000	map	map	map	res txt data	spot exp gas clean sa all all8 all16 intall8
031269	031297	29	2013-05-14 07:34:26	2013-05-16 14:50:53	0	0	100	50000	map	map	map	res txt data	spot exp gas clean sa all all8 all16 intall8
031265	031295	31	2013-05-13 17:40:29	2013-05-16 11:27:43	280	0	100	50000	map	map	map	res txt data	spot exp gas clean sa all all8 all16 intall8
031265	031295	31	2013-05-13 17:40:29	2013-05-16 11:27:43	80	0	100	50000	map	map	map	res txt data	exp spot gas clean sa all all8 all16 intall8
031280	031295	16	2013-05-13 13:33:20	2013-05-16 11:27:43	190	0	100	50000	map	map	map	res txt data	spot exp gas clean sa all all8 all16 intall8
031265	031295	31	2013-05-13 17:40:29	2013-05-16 11:27:43	0	-90	100	50000	map	map	map	res txt data	sa all spot exp gas clean all8 all16 intall8
031265	031295	31	2013-05-13 17:40:29	2013-05-16 11:27:43	0	0	100	50000	map	map	map	res txt data	spot exp gas clean sa all all8 all16 intall8
031265	031295	31	2013-05-13 17:40:29	2013-05-16 11:27:43	0	90	100	50000	map	map	map	res txt data	spot exp gas clean sa all all8 all16 intall8
031265	031295	31	2013-05-13 17:40:29	2013-05-16 11:27:43	0	0	100	50000	map	map	map	res txt data	spot exp gas clean sa all all8 all16 intall8

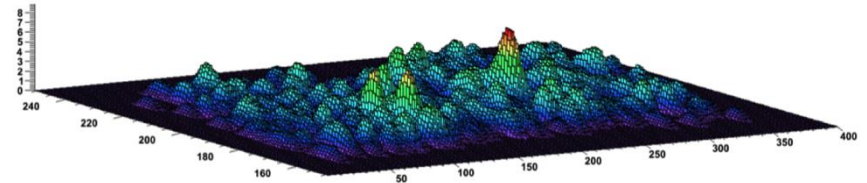
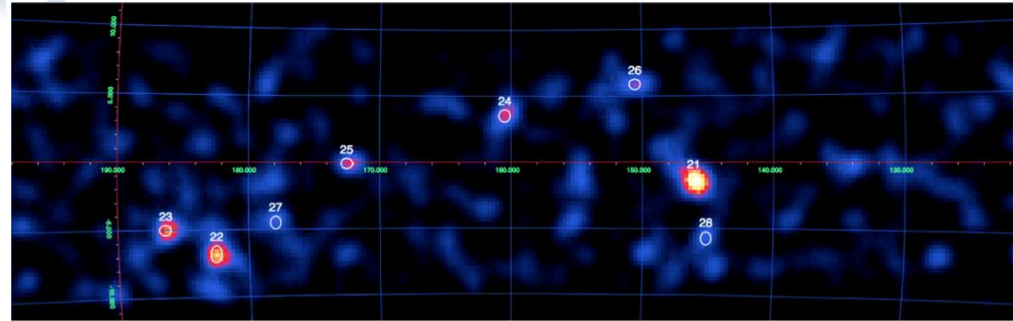
not only APPS

A. Bulgarelli

11th AGILE Science Workshop M: 2013, ASI Headquarters, Ro

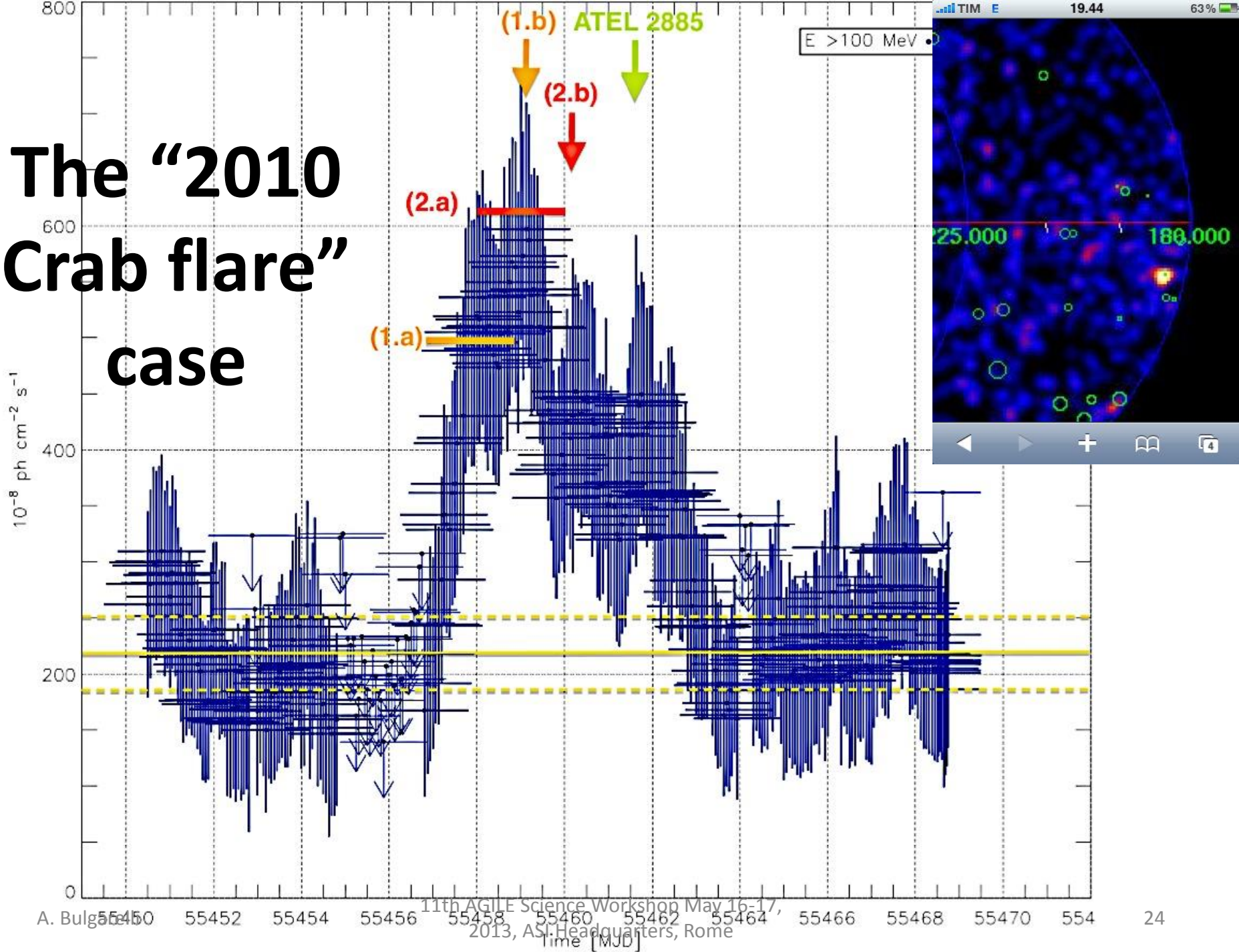
Technicalities

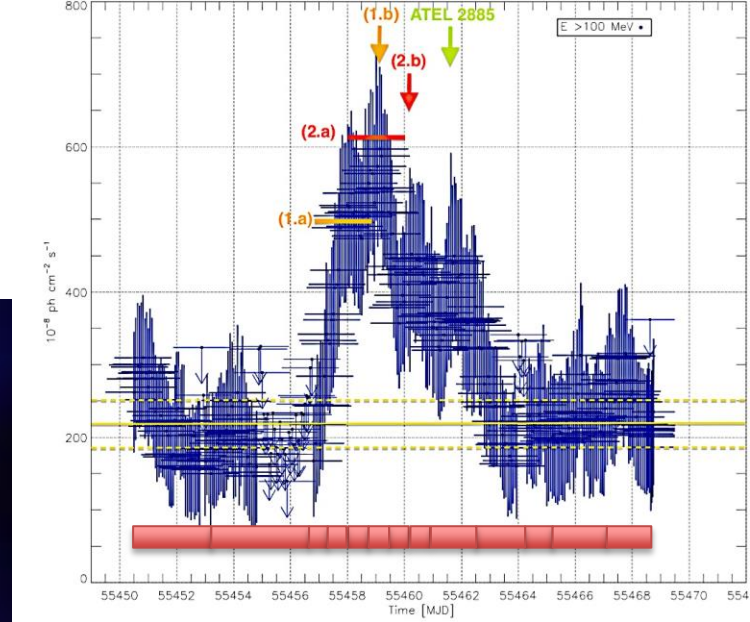
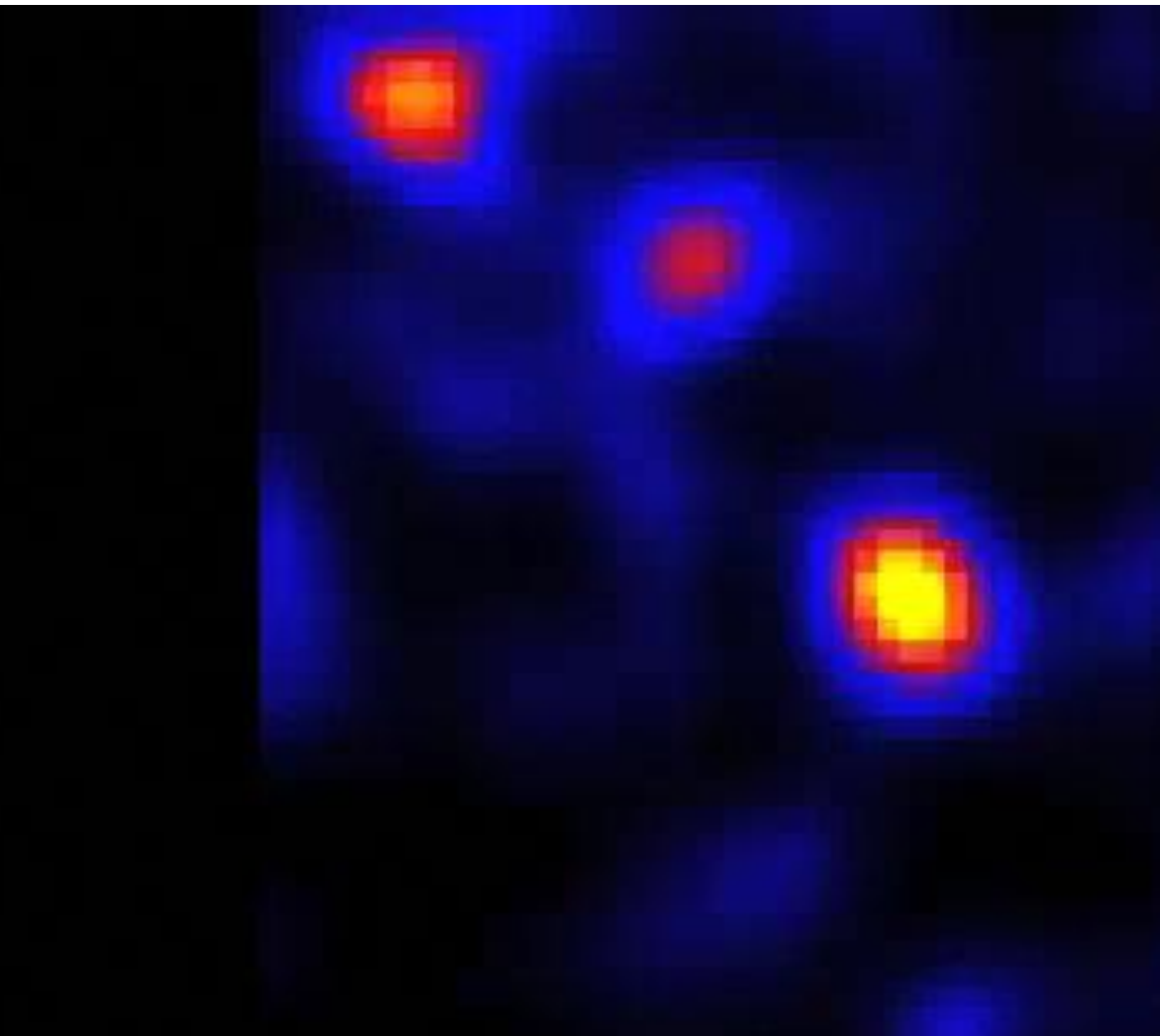
- Scripting in Ruby
- About **64 cpu cores** for overall processing
- The system works with different integration time windows: (1-2-7 days)
- A **binned maximum likelihood estimator** (developed @IASFMI) is used as analysis tool



- The selection of candidate flares is performed with
 - transient blind search methods (“**spotfinder**”)
 - transient search from a **list** of known sources

The “2010 Crab flare” case





AGILE detection of enhanced gamma-ray emission from the Crab Nebula region

ATel #2855; [M. Tavani \(INAF/IASF Roma\)](#), [E. Striani \(Univ. Tor Vergata\)](#), [A. Bulgarelli \(INAF/IASF Bologna\)](#), [F. Gianotti, M. Trifoglio \(INAF/IASF Bologna\)](#), [C. Pittori, F. Verrecchia \(ASDC\)](#), [A. Argan, A. Trois, G. De Paris, V. Vittorini, F. D'Ammando, S. Sabatini, G. Piano, E. Costa, I. Donnarumma, M. Feroci, L. Pacciani, E. Del Monte, F. Lazzarotto, P. Soffitta, Y. Evangelista, I. Lapshov \(INAF-IASF-Rm\)](#), [A. Chen, A. Giuliani \(INAF-IASF-Milano\)](#), [M. Marisaldi, G. Di Cocco, C. Labanti, F. Fuschino, M. Galli \(INAF/IASF Bologna\)](#), [P. Caraveo, S. Mereghetti, F. Perotti \(INAF/IASF Milano\)](#), [G. Pucella, M. Rapisarda \(ENEA-Roma\)](#), [S. Yercellone \(IASF-Pa\)](#), [A. Pellizzoni, M. Pilia \(INAF/OA-Cagliari\)](#), [G. Barbiellini, F. Longo \(INFN Trieste\)](#), [P. Picozza, A. Morselli \(INFN and Univ. Tor Vergata\)](#), [M. Prest \(Universita' dell'Insubria\)](#), [P. Lipari, D. Zanella \(INFN Roma-1\)](#), [P. W. Cattaneo, A. Rappoldi \(INFN Pavia\)](#), [P. Giommi, P. Santolamazza, F. Lucarelli, S. Colafrancesco \(ASDC\)](#), [L. Salotti \(ASI\)](#)

on 22 Sep 2010; 14:45 UT

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 Credential Certification: [Marco Tavani \(tavani@iasf-roma.inaf.it\)](mailto:tavani@iasf-roma.inaf.it)

Subjects: Pulsar

Referred to by ATel #: [2856](#), [2858](#), [2861](#), [2866](#), [2867](#), [2868](#), [2872](#), [2879](#), [2882](#), [2889](#), [2893](#), [2903](#), [2921](#), [2967](#), [2968](#), [2994](#), [3058](#), [3276](#), [3283](#)

AGILE is detecting an increased gamma-ray flux from a source positionally consistent with the Crab Nebula.

Integrating during the period 2010-09-19 00:10 UT to 2010-09-21 00:10 UT the AGILE-GRID detected enhanced gamma-ray emission above 100 MeV from a source at Galactic coordinates (l,b) = (184.6, -6.0) +/- 0.4 (stat.) +/- 0.1 (syst.) deg, and flux F > 500 e-8 ph/cm2/sec above 100 MeV, corresponding to an excess with significance above 4.4 sigma with respect to the average flux from the Crab nebula (F = (220 +/- 15)e-8 ph/cm^2/sec, Pittori et al., 2009, A&A, 506, 1563).

We strongly encourage multifrequency observations of the Crab Nebula region.

The first alert received from Crab with a flux level that exceed 1-sigma mean flux level was received at 2010-09-20T02:04:04 UTC.

The Crab reach its maximum flux for E>100 MeV in AGILE data between 2010-09-19T01:54:43 and 2010-09-20T23:47:51 UTC in the continuous integration procedure with 2 days integration time. The alert was generated via email and SMS at 2010-09-21T02:00:54 UTC.



Fermi LAT confirmation of enhanced gamma-ray emission from the Crab Nebula region

ATel #2861; [R. Buehler \(SLAC/KIPAC\)](#), [F. D'Ammando \(INAF-IASF Palermo\)](#), [E. Hays \(NASA/GSFC\) on behalf of the Fermi Large Area Telescope Collaboration](#)
 on 23 Sep 2010; 17:34 UT

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 Credential Certification: [Rolf Buehler \(buehler@slac.stanford.edu\)](mailto:buehler@slac.stanford.edu)

Subjects: >GeV, Pulsar

Referred to by ATel #: [2866](#), [2867](#), [2868](#), [2872](#), [2879](#), [2882](#), [2889](#), [2893](#), [2903](#), [2921](#), [2967](#), [2968](#), [2994](#), [3058](#), [3276](#), [3283](#)

Following the detection by AGILE of increasing gamma-ray activity from a source positionally consistent with the Crab Nebula occurred from September 19 to 21 (ATel #2855), we report on the analysis of the >100 MeV emission from this region with the Large Area Telescope (LAT), one of the two instruments on the Fermi Gamma-ray Space Telescope.

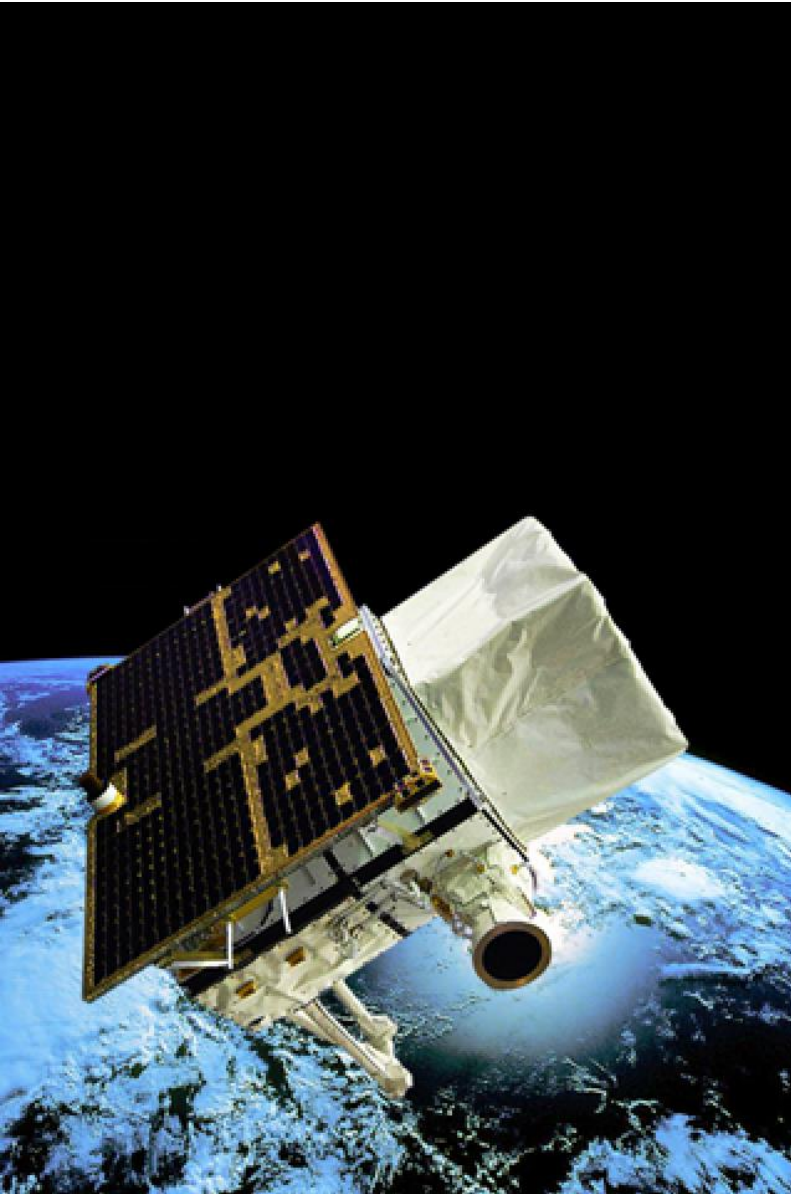
Preliminary LAT analysis indicates that the gamma-ray emission (E > 100 MeV) observed during this time period at the location of the Crab Nebula is (606 +/- 43) x 10^-8 ph/cm2/sec, corresponding to an excess with significance > 9 sigma with respect to the average flux from the Crab nebula of (286 +/- 2) x 10^-8 ph/cm2/sec, estimated over all the Fermi operation period (only statistical errors are given). Ongoing Fermi observations indicate that the flare is continuing.

The flaring component has a spectral index of 2.49 +/- 0.14. Its position, Ra: 83.59 Dec: 22.05 with a 68% error radius of 0.06 deg, is coincident with the Crab Nebula.

Fermi will interrupt its all-sky scanning mode between 2010-09-23 15:49:00 UT and 2010-09-30 15:49:00 UT to observe the Crab Nebula. Afterwards regular gamma-ray monitoring of this source will continue. We strongly encourage further multifrequency observations of that region.

For this source the Fermi LAT contact person is Rolf Buehler (buehler@stanford.edu).

The Fermi LAT is a pair conversion telescope designed to cover the energy band from 20 MeV to greater than 300 GeV. It is the product of an international collaboration between NASA and DOE in the U.S. and many scientific institutions across France, Italy, Japan and Sweden.



Conclusions

- Key factors:
 - IASF Bologna pipeline that react within 2 hours
 - Two independent pipelines
 - Cross check with consolidated data.
- The **effectiveness of the monitoring** system is demonstrated on a daily basis and by the great number of ATel (90 in 6 years) published by AGILE Team; very important discoveries were started from this system.
- This allows an effective follow-up of flaring sources, enabling AGILE to **maximize the scientific return of the mission.**

**THANKS FOR YOUR
ATTENTION!**