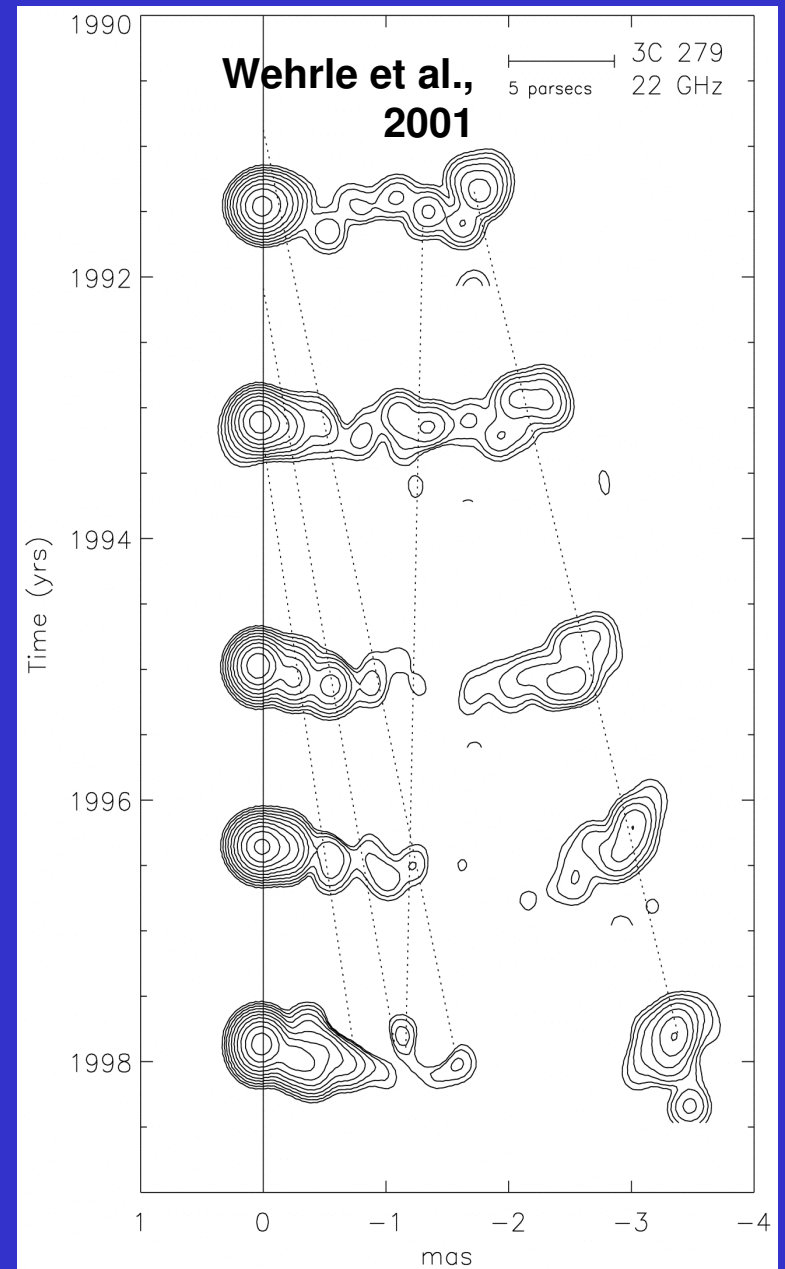
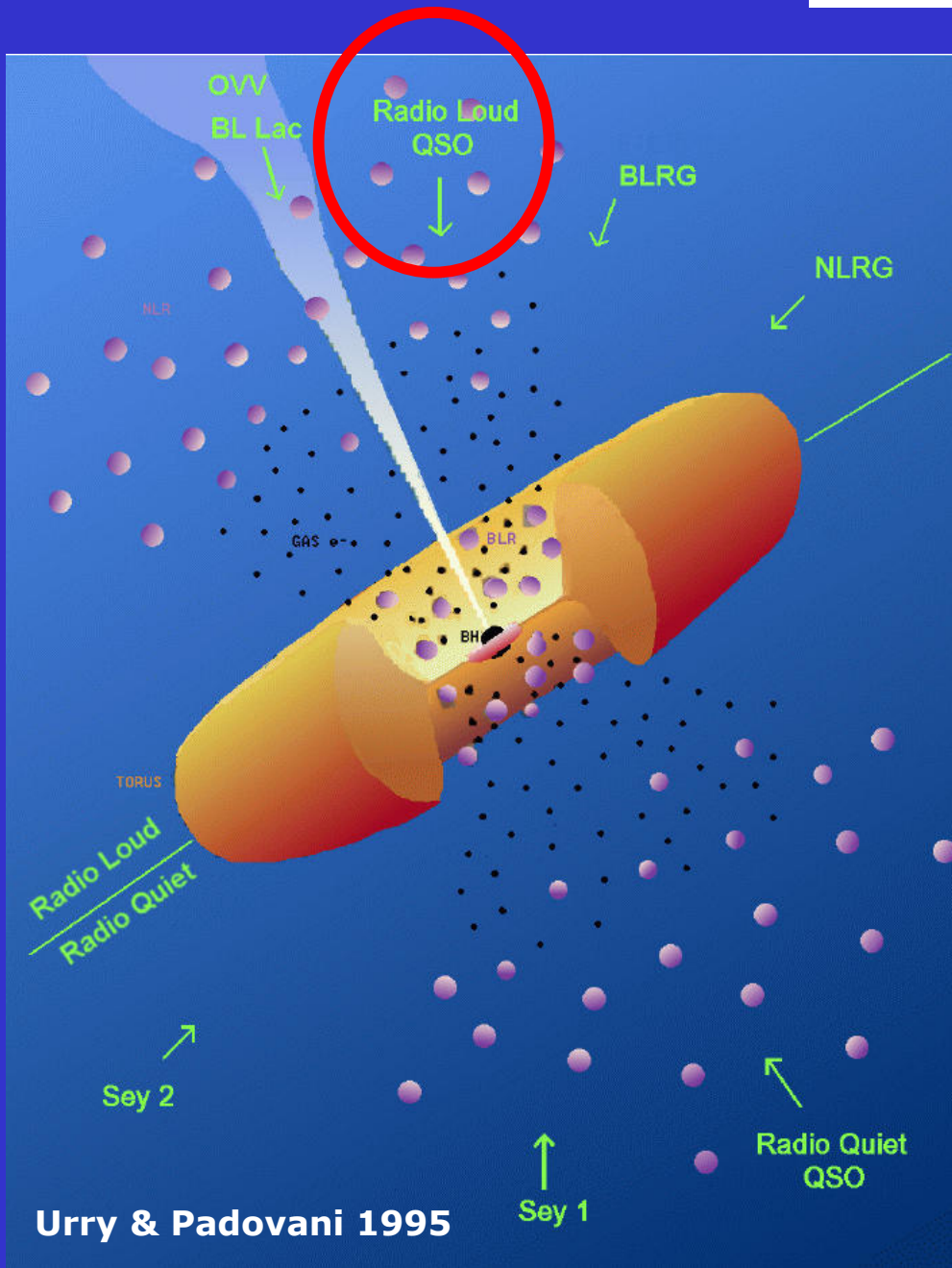


Un diamante* è per sempre

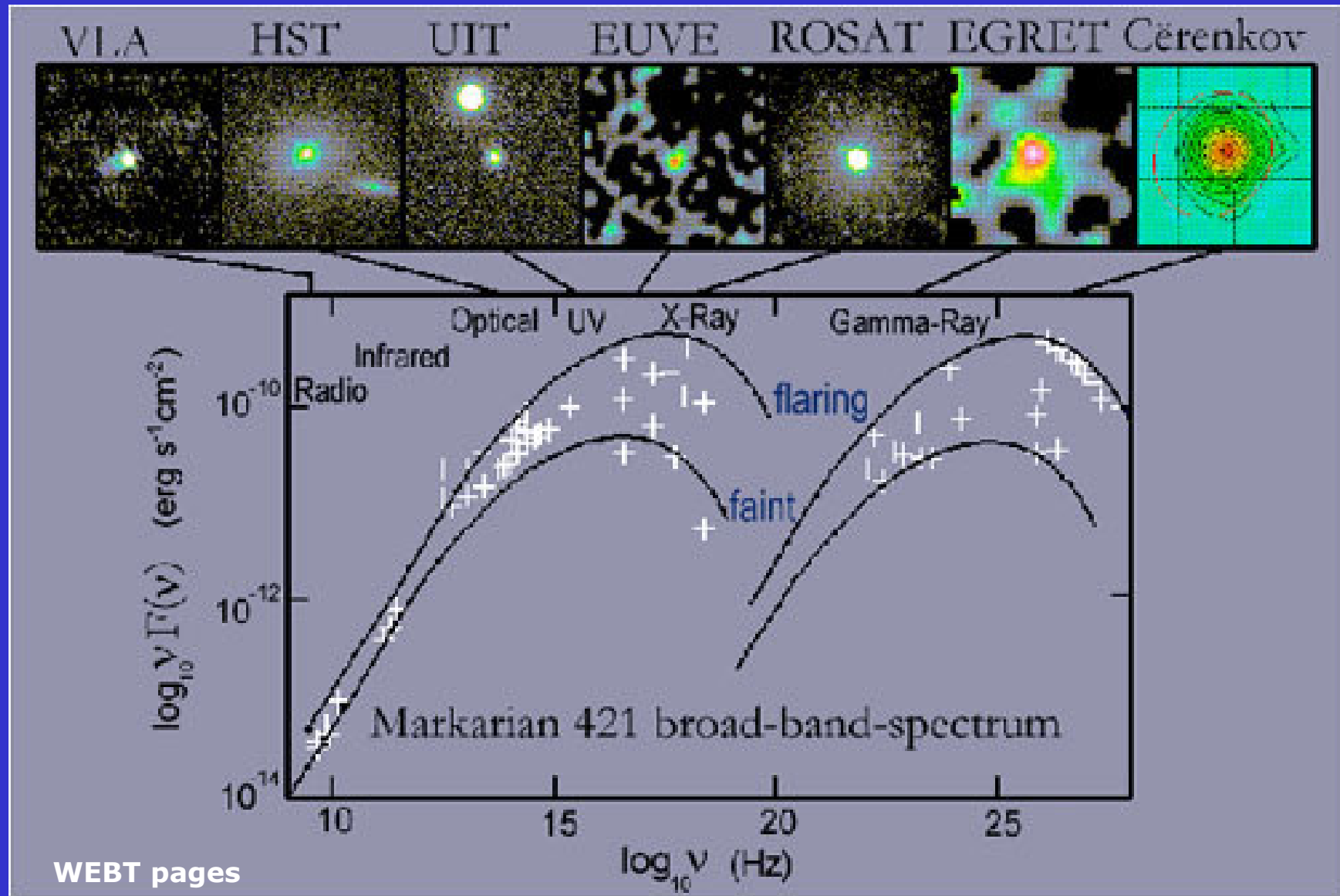
Stefano Vercellone INAF/IASF Milano

****The Crazy Diamond AGN***

AGNs



Blazars



Chi è la protagonista

3C 454.3 ossia PKS 2251+158

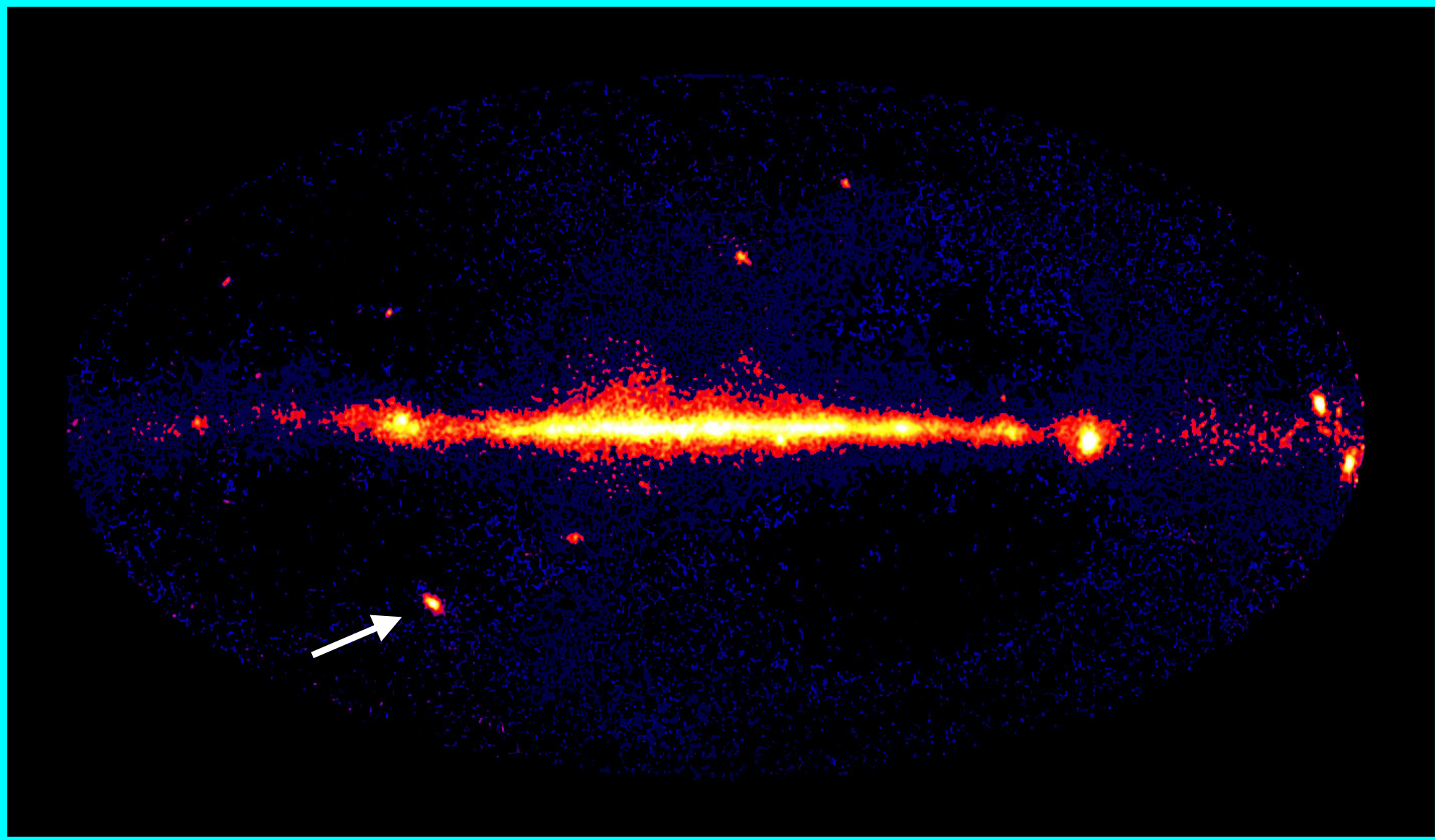
RA : 22 53 57.75 (l = 86.111)

DEC : +16 08 53.56 (b = -38.184)

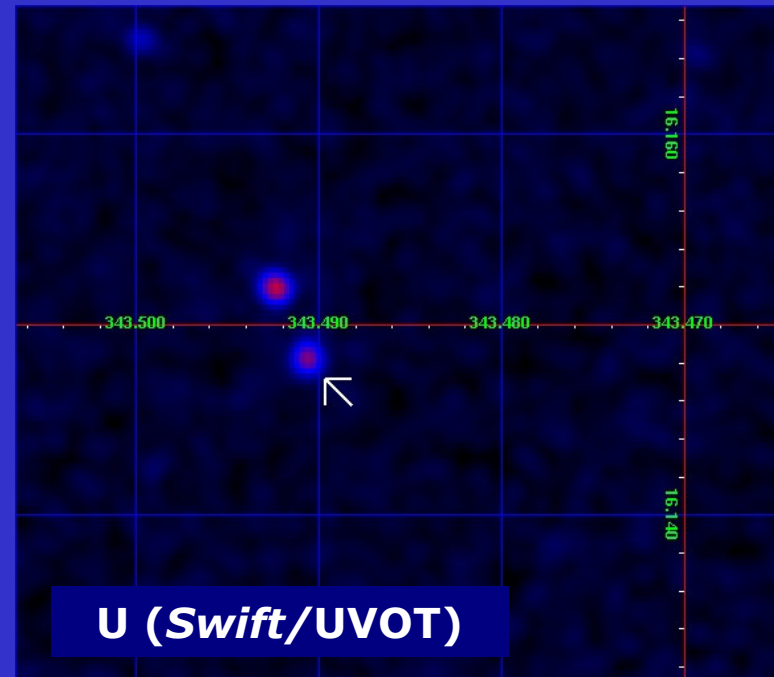
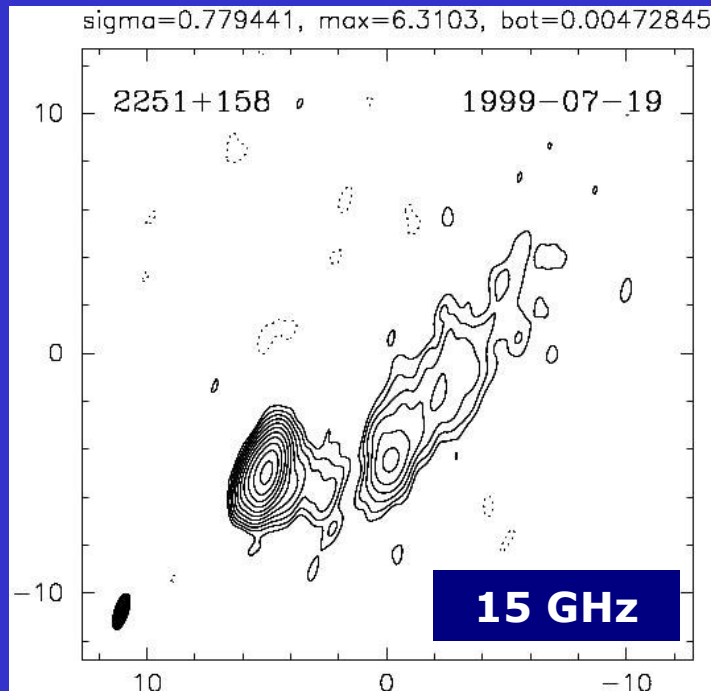
z : 0.859

Flat–Spectrum Radio Quasar (FSRQ)

Dove risiede



Che caratteristiche ha



U_mag = 15.51

F_5GHz = 10 Jy

F_2-10 keV = 1E-12 erg/cm²/s

Perchè *crazy diamond* ?

2007-12-07

"Shine On You Crazy Diamond (I-V)" - Pink Floyd

**Remember when you were young, you shone like the sun.
Shine on you crazy diamond.**

**Now there's a look in your eyes, like black holes in the sky.
Shine on you crazy diamond.**

...

...

...

Molto intensa

Estremamente variabile

Quasi sempre rivelata da AGILE

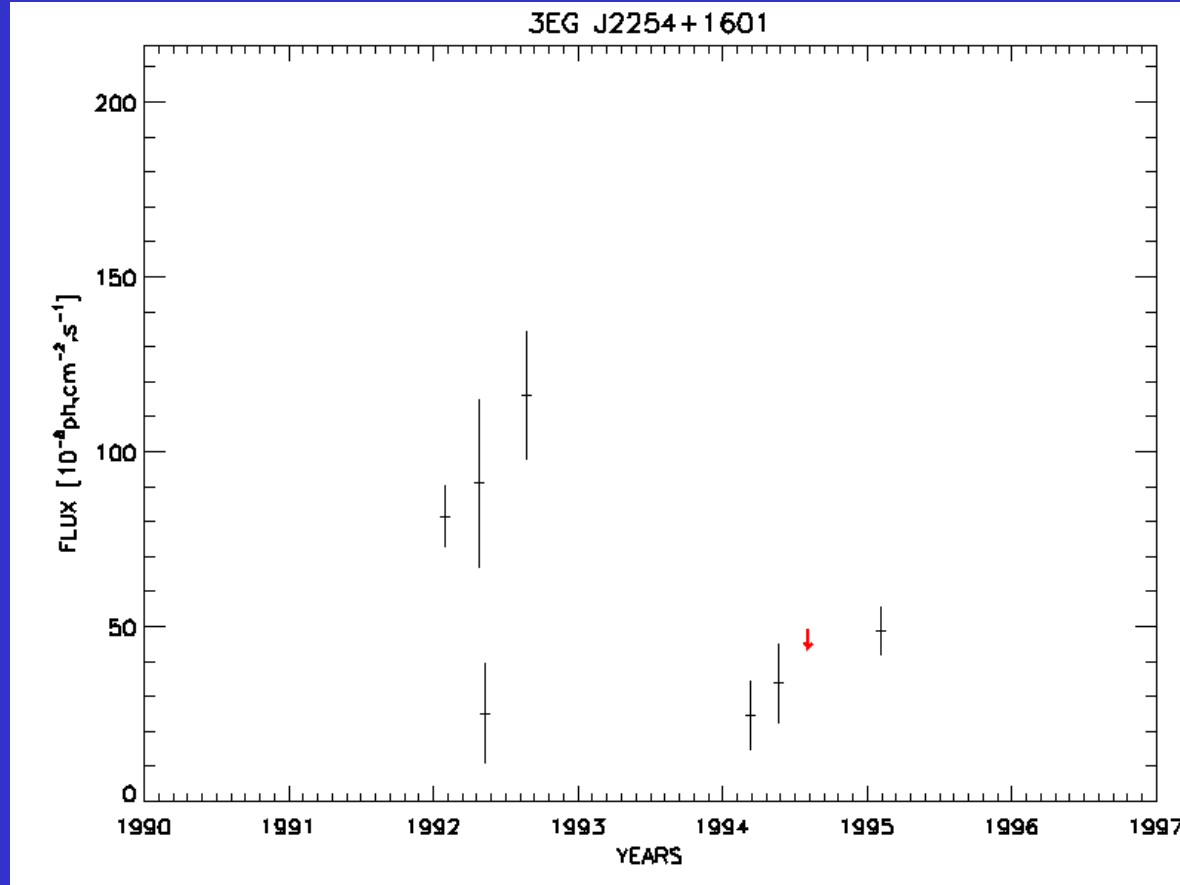
**Una delle sorgenti extragalattiche più luminose nel
cielo gamma**

EGRET

Sorgente con forte variabilità a tutte le frequenze e con elevata attività nel gamma:

1992/01-02 $\rightarrow (40 - 140)E-8 \text{ ph cm}^{-2} \text{ s}^{-1}$

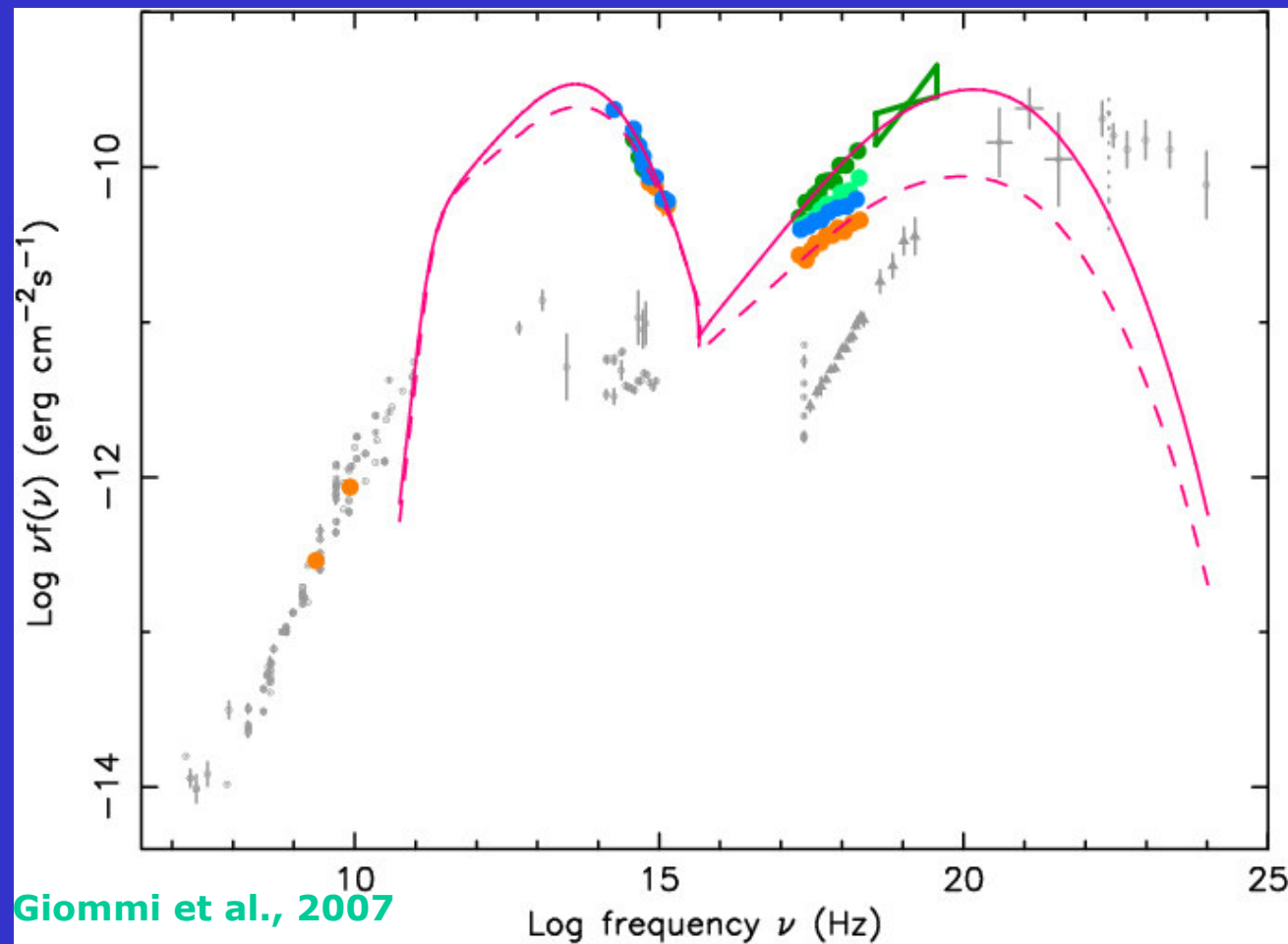
1995/11-12 $\rightarrow 40E-8 \text{ ph cm}^{-2} \text{ s}^{-1}$



Post-EGRET

Nel 2005 flare molto intenso in ottico ed X

→ **NESSUN SATELLITE GAMMA IN ORBITA !!!!**



3C 454.3: Luglio '07

Vercellone et al, 2008, ApJL, 676, 13

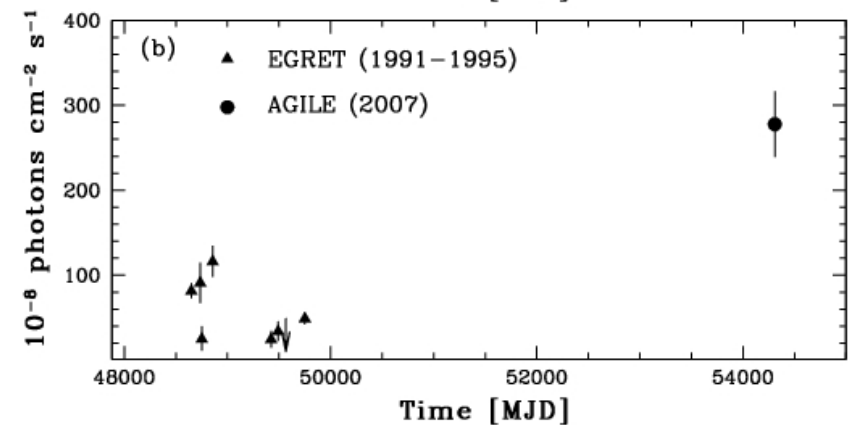
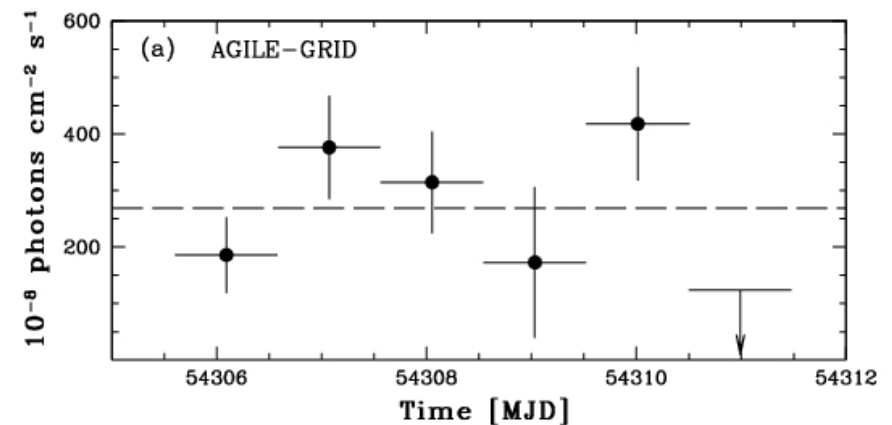
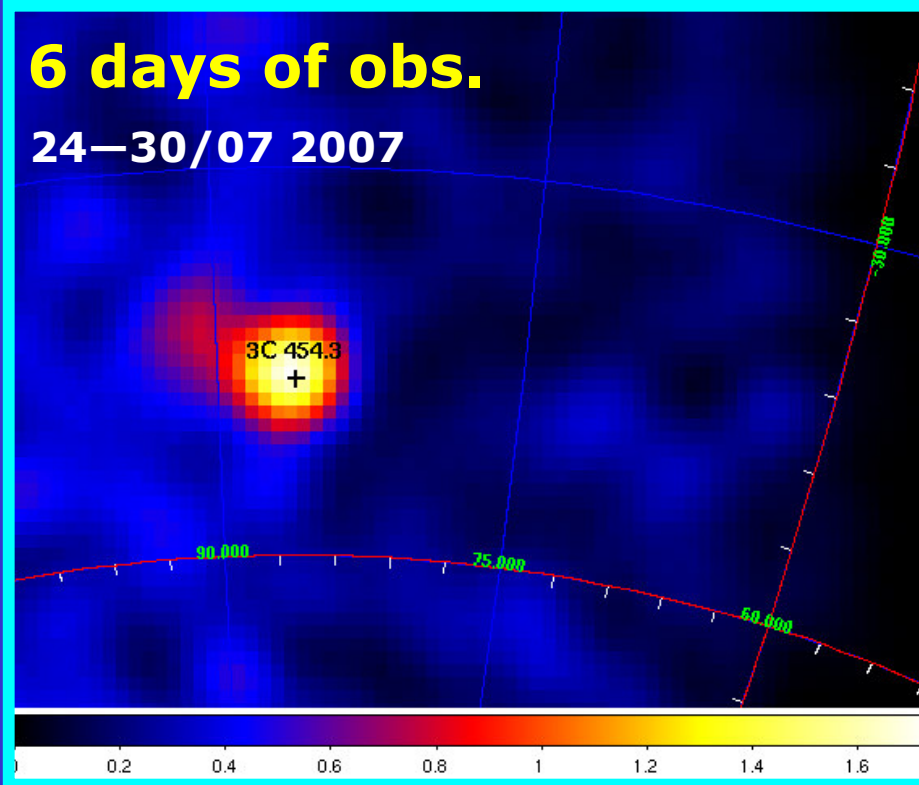
AGILE repointing a 36 deg off-axis

$\langle F_\gamma \rangle = (280 \pm 40) E^{-8} \text{ ph/cm}^2/\text{s } E > 100 \text{ MeV}$

Massimo flusso pubblicato (ma Fermi ...)

6 days of obs.

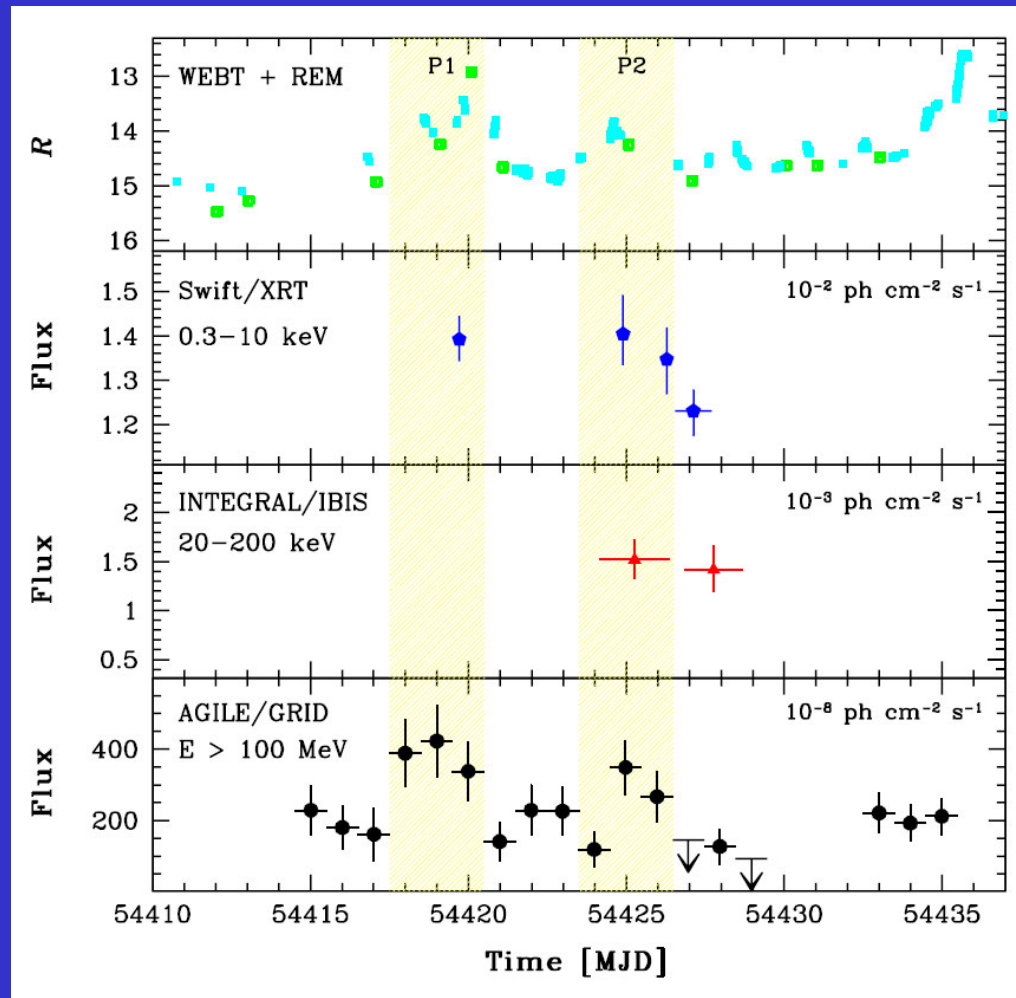
24–30/07 2007



3C 454.3: Novembre '07

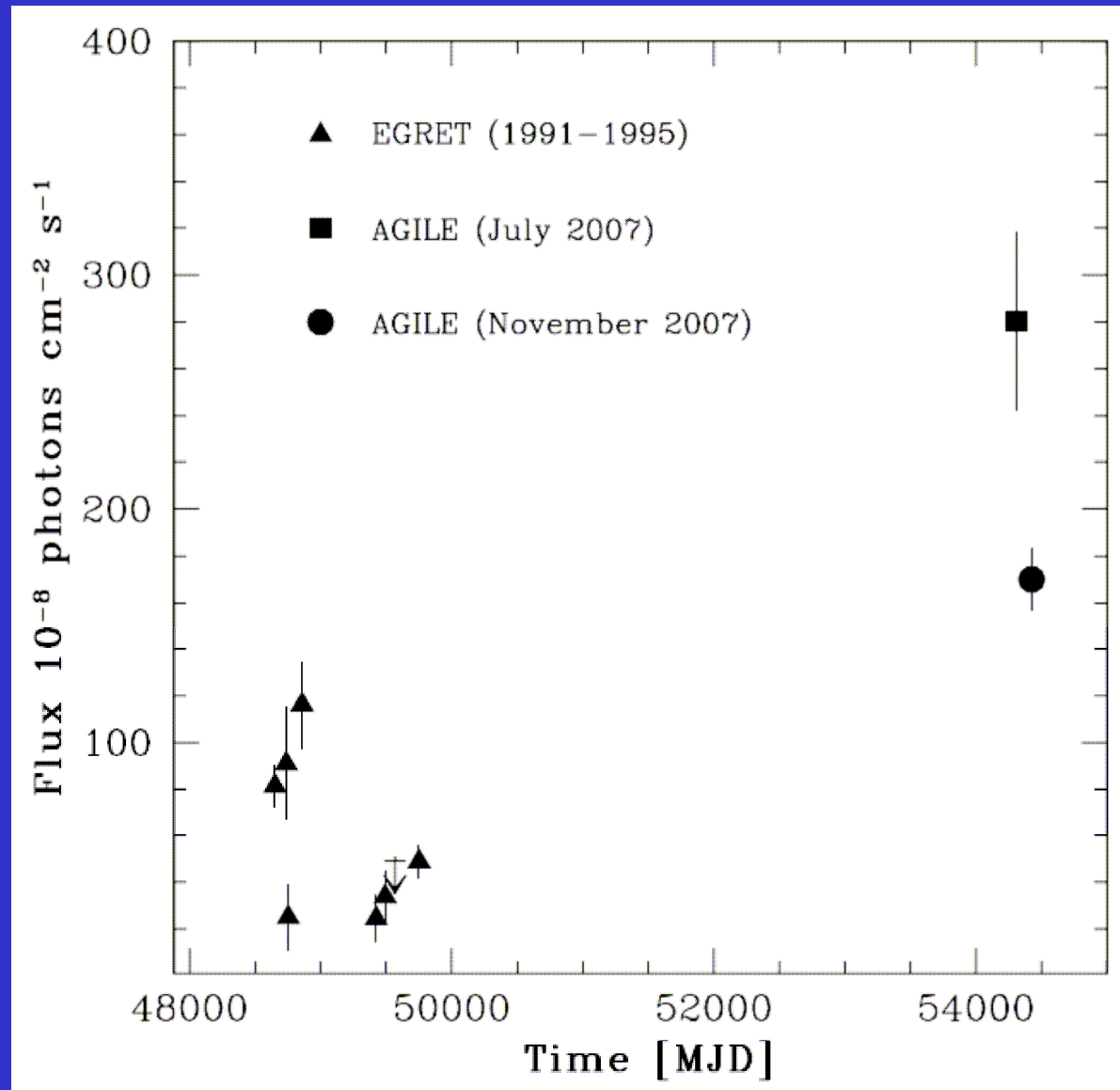
Vercellone et al., *ApJ*, arXiv:0809.1737

Risultato di una campagna multi- λ campagna basata su ToOs pre-approvate

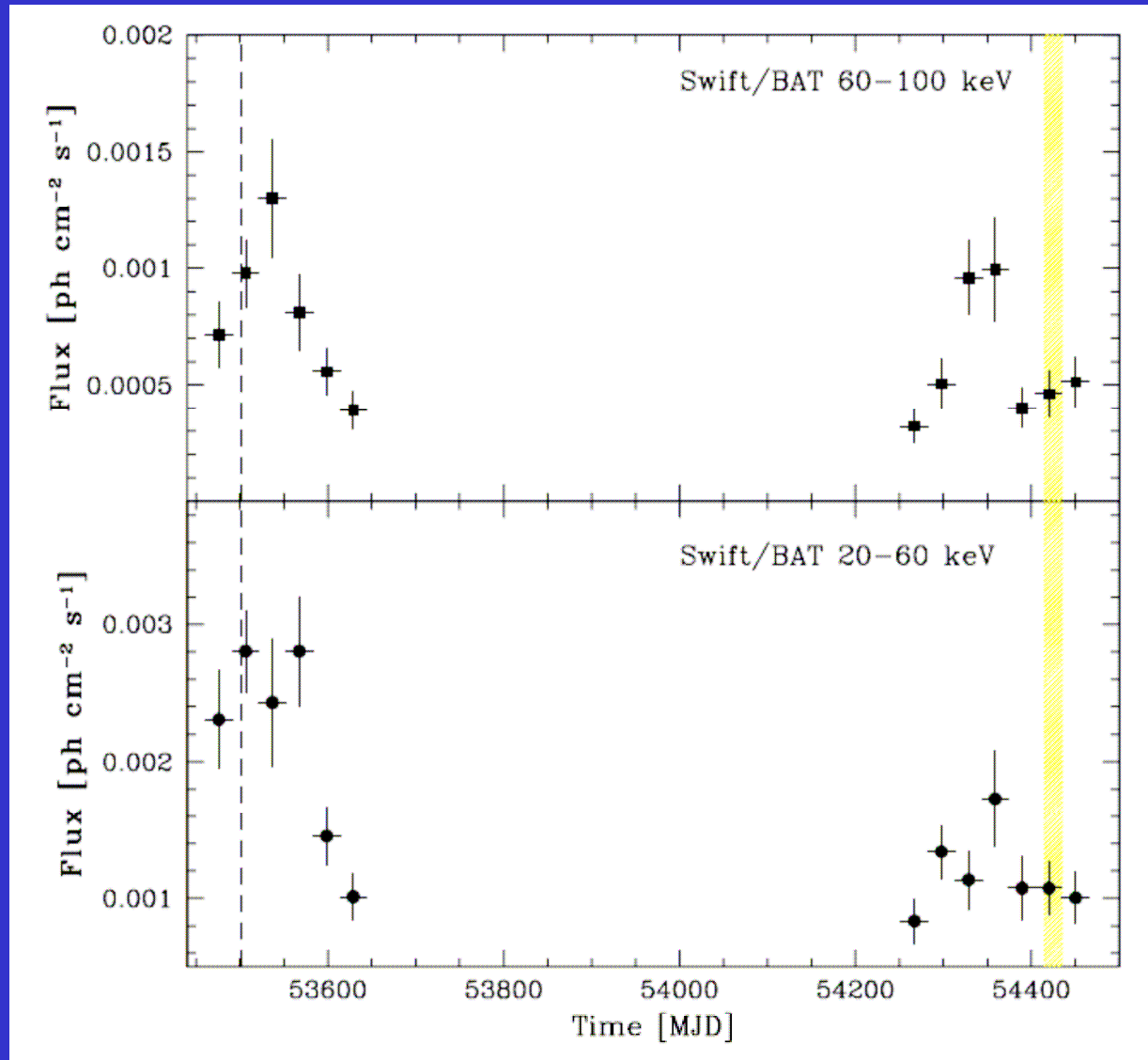


10/11 – 01/12 2007

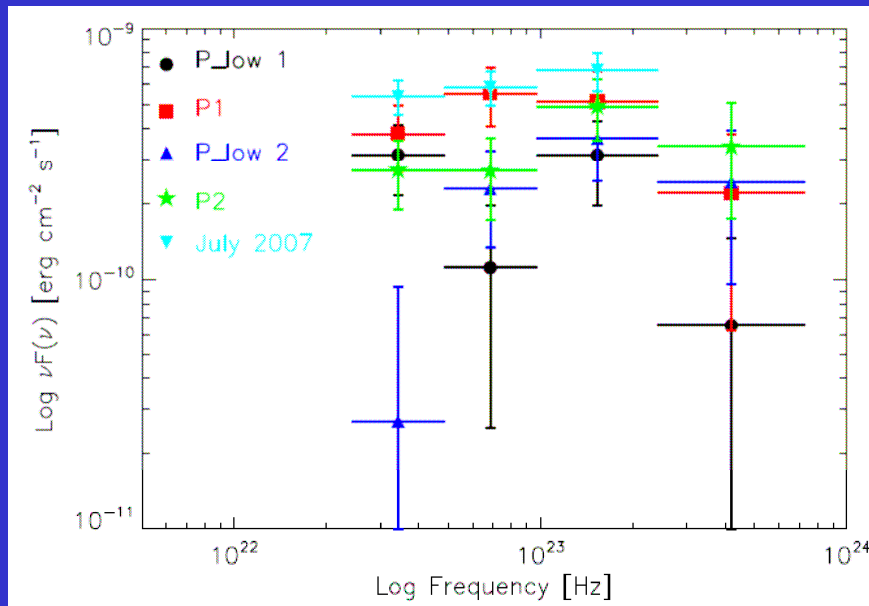
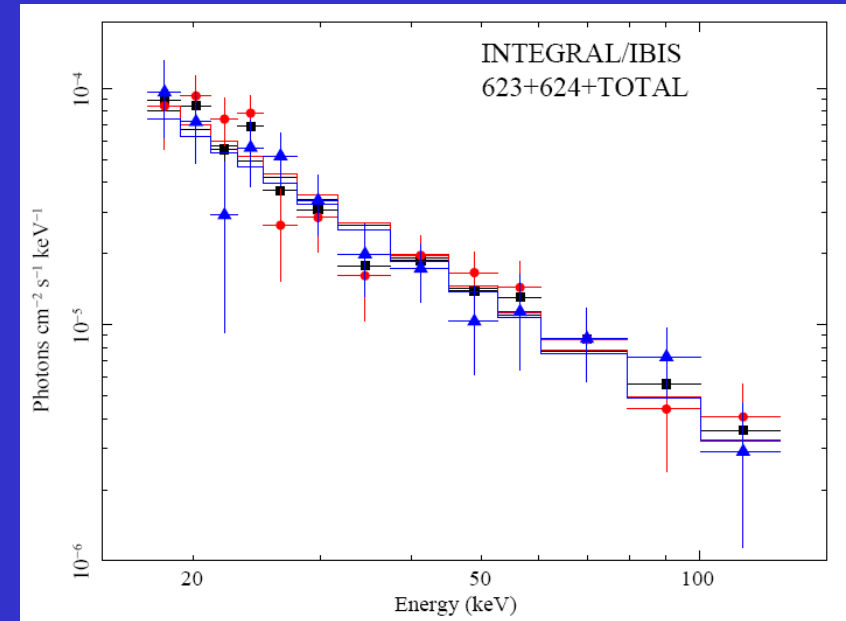
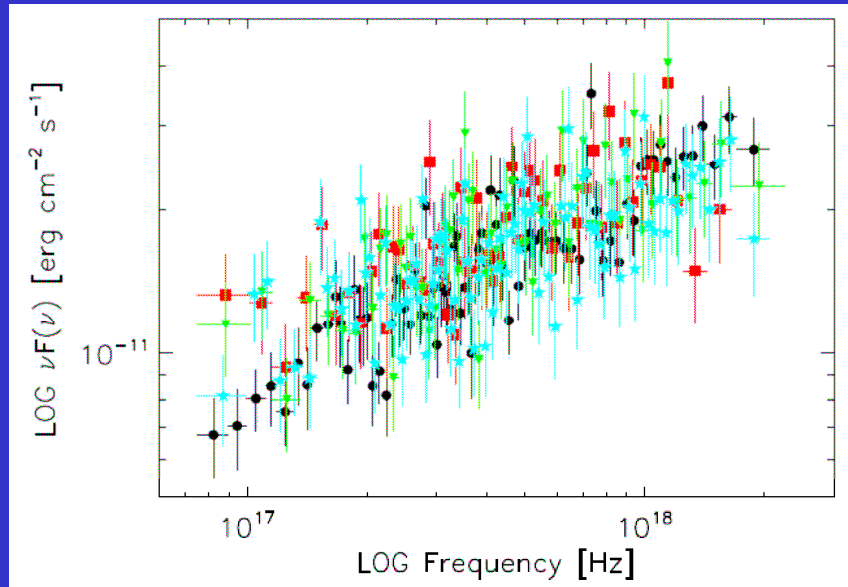
3C 454.3: Novembre '07



3C 454.3: Novembre '07



3C 454.3: Novembre '07



$$F_{E>100\text{MeV}} = (170 \pm 13) \times 10^{-8} \text{ photons cm}^{-2} \text{ s}^{-1}$$

$$\Gamma_{\text{GRID}} = 1.73 \pm 0.16$$

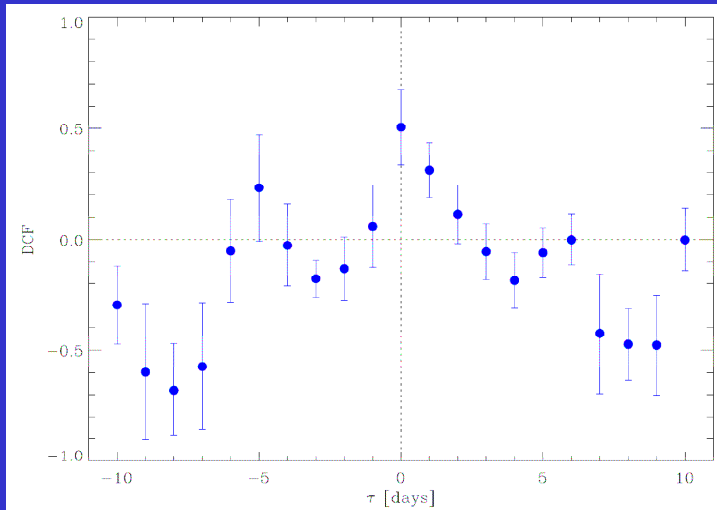
$$F_{20-200\text{keV}} = 1.49 \times 10^{-3} \text{ photons cm}^{-2} \text{ s}^{-1}$$

$$\Gamma_{\text{IBIS}} = 1.75 \pm 0.24$$

$$(1.23 - 1.40) \times 10^{-2} \text{ photons cm}^{-2} \text{ s}^{-1}$$

$$\Gamma_{\text{XRT}} = 1.56 - 1.73.$$

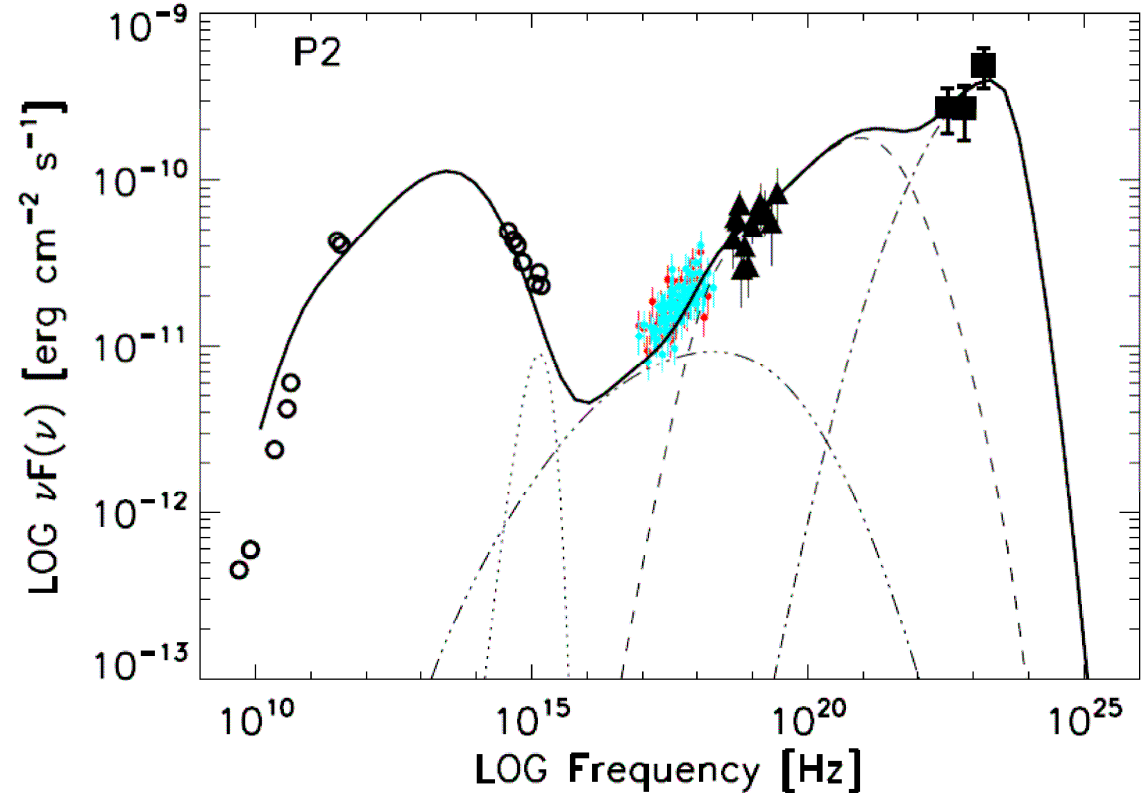
3C 454.3: Novembre '07



L'analisi di correlazione è consistente con nessun time-lag tra variazioni nel flusso γ -ray ed ottico.

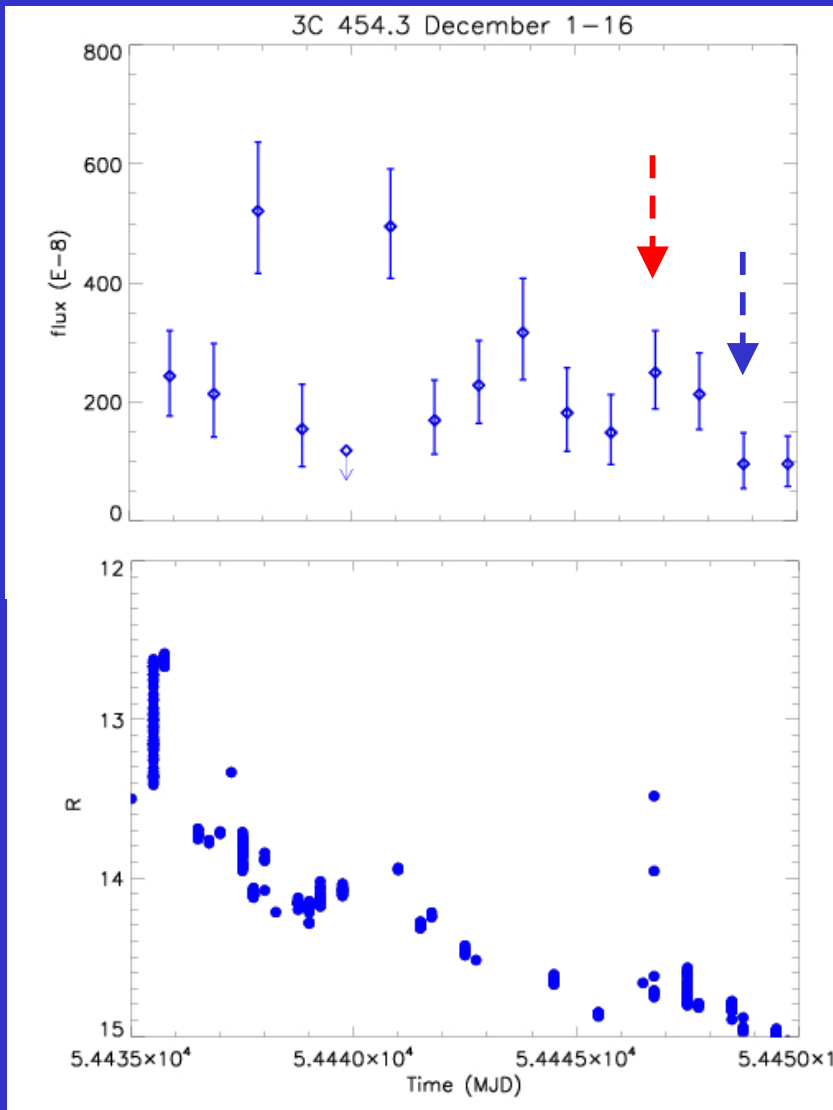
L'emissione tra 30 MeV e 30 GeV è dominata da inverse Compton scattering di elettroni relativistici del getto da fotoni della BLR

Parameter	SED P1	SED P2	Units
α_l	2.1	2.2	
α_h	4.5	5.0	
γ_{\min}	10	10	
γ_b	500	500	
K	14	12	cm^{-3}
R	35	35	10^{15} cm
B	10	8	G
δ	14.64	14.64	
L_d	5	5	$10^{46} \text{ erg s}^{-1}$
r	0.05	0.05	pc
Θ_0	2.6	2.6	degrees
Γ	8.4	8.4	



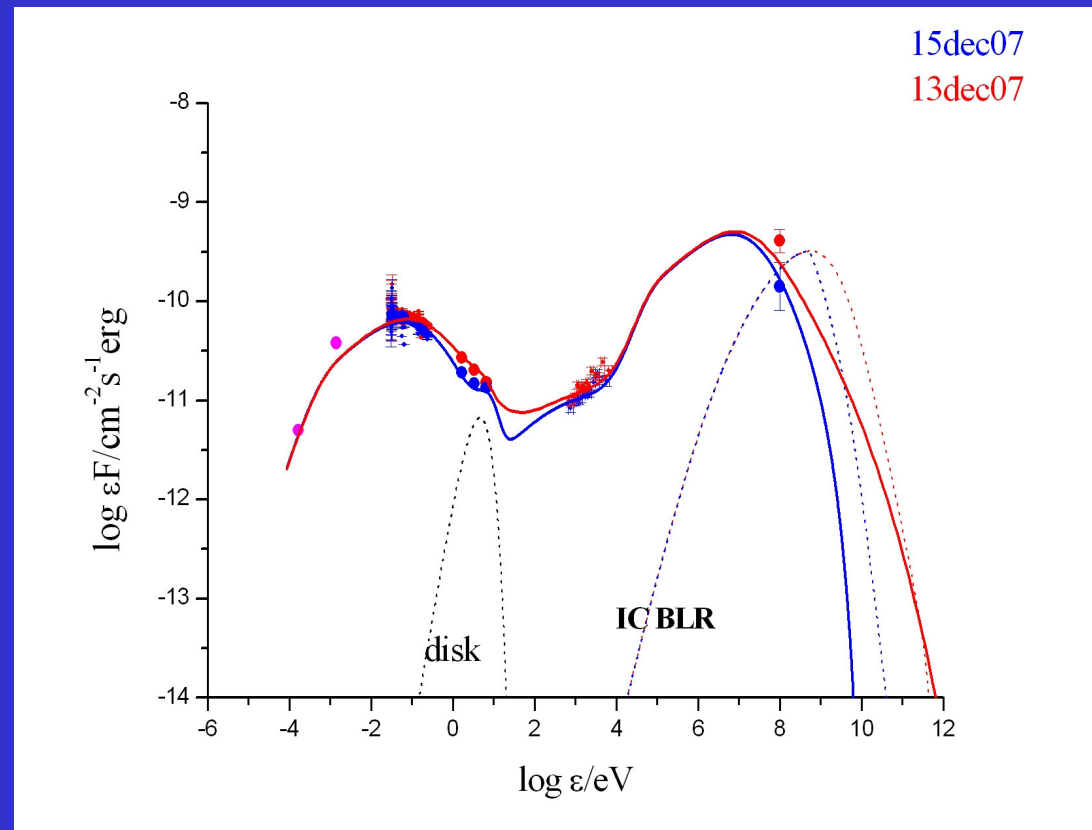
3C 454.3: Dicembre '07

01–16/12 2007



Donnarumma et al., in preparation

Campagna multi- λ campaign con il contributo *Suzaku*, *Spitzer*, *Swift*, *WEBC*, and *REM*.



3C 454.3: Maggio–Giugno '07

Vercellone et al., in preparation

Multi- λ : RXTE, *Swift*, GASP, REM, VLBI

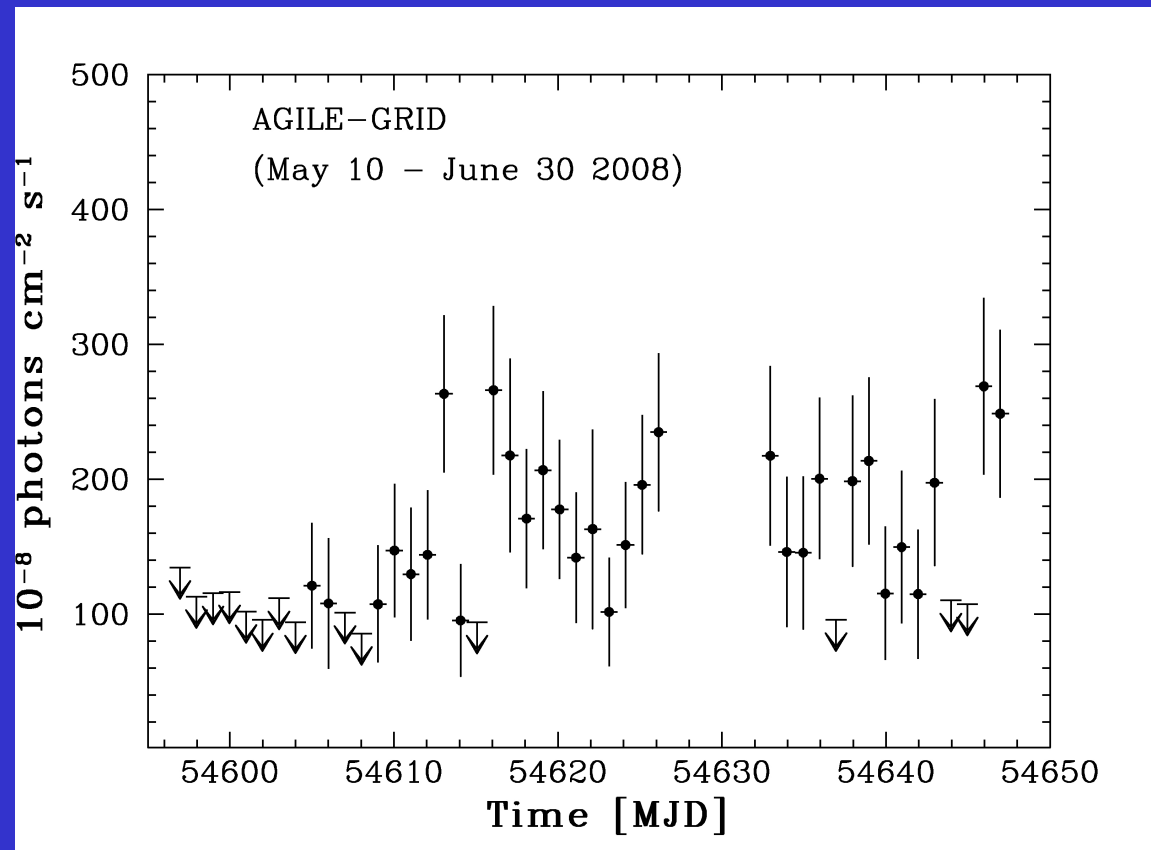
Un anno di monitoring con AGILE: paragone tra SEDs, LCs, time-lags, spettri, etc...

P1 : 10 Maggio – 09 Giugno

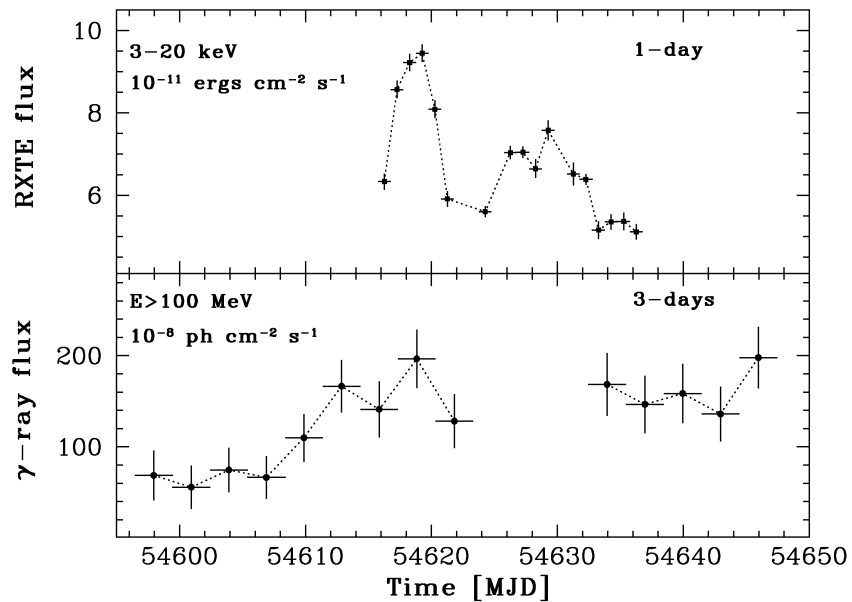
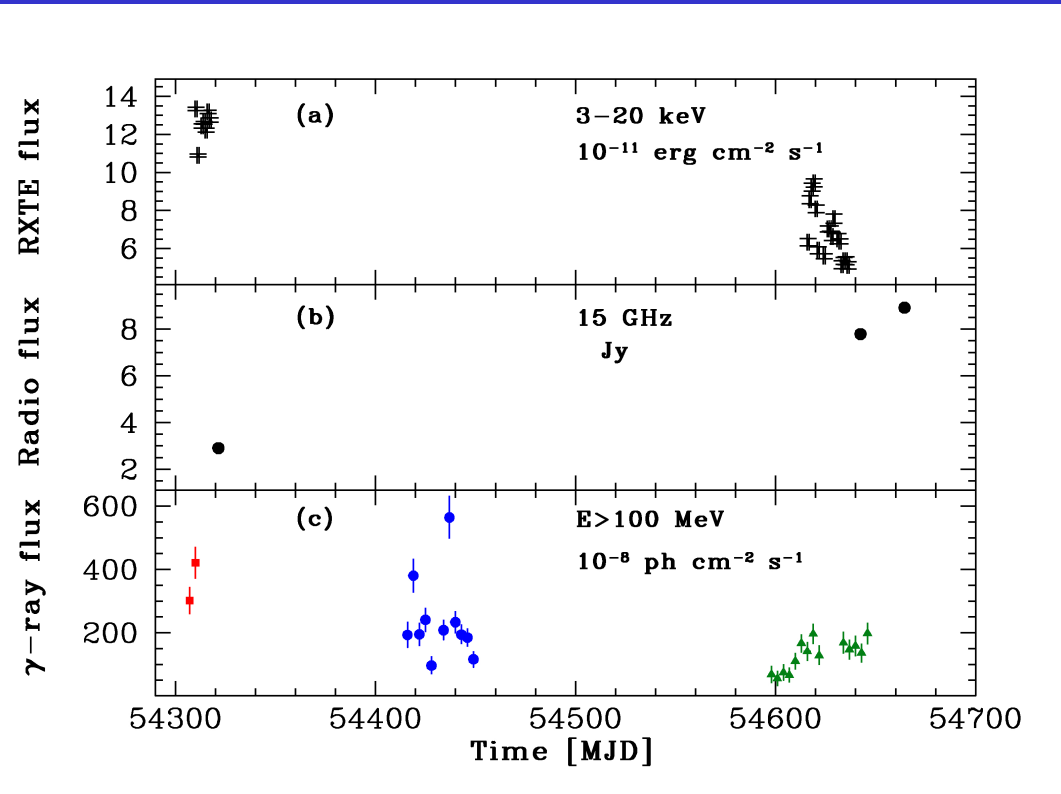
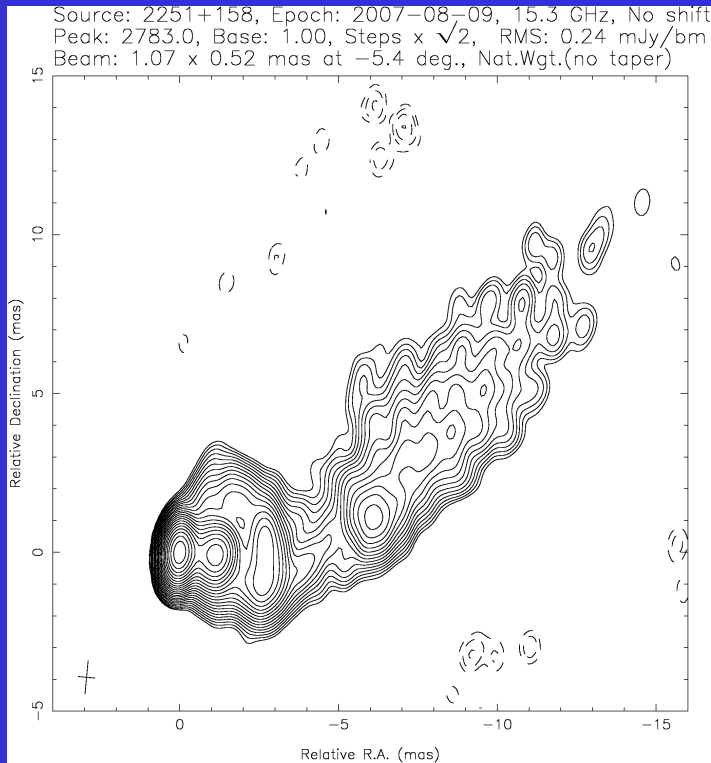
$F = (132 \pm 10) \text{E-8 ph/cm}^2/\text{s}$

P2 : 15 Giugno – 30 Giugno

$F = (162 \pm 15) \text{E-8 ph/cm}^2/\text{s}$



3C 454.3: Maggio–Giugno '07



3C 454.3: *Fermi*/LAT

GLAST-LAT detection of extraordinary gamma-ray activity in 3C 454.3

ATel #1628; *G. Tosti (Univ/INFN-Perugia), J. Chiang (SLAC), B. Lott (CENBG/Bordeaux), E. do Couto e Silva (SLAC), J. E. Grove (NRL/Washington), J. G. Thayer (SLAC) on behalf of the GLAST Large Area Telescope Collaboration*
on 24 Jul 2008; 14:25 UT

Password Certification: Gino Tosti (tosti@pg.infn.it)

Subjects: Gamma Ray, >GeV, AGN, Quasars

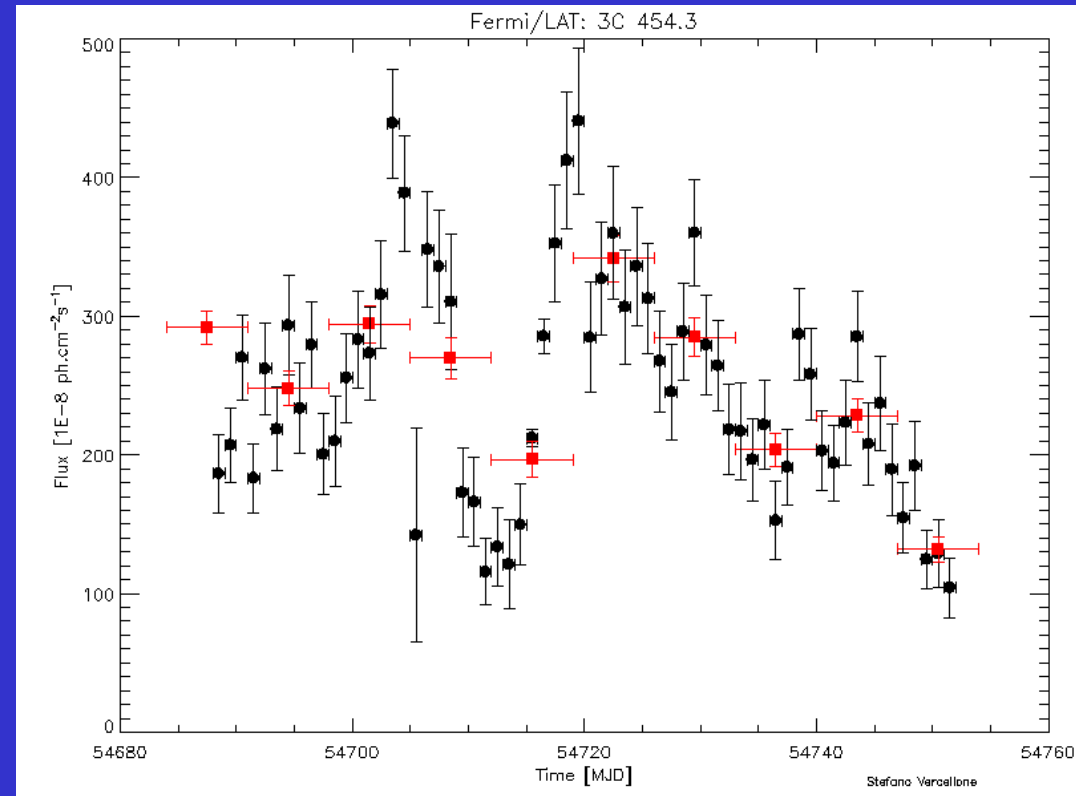
Referred to by ATel #: [1634](#)

The Large Area Telescope (LAT), one of two instruments on the Gamma-ray Large Area Space Telescope (GLAST) (launched June 11, 2008), which is still in its post-launch commissioning and checkout phase has been monitoring extraordinarily high flux from the gamma-ray blazar 3C 454.3 since June 28, 2008. This confirms the bright state of the source reported by AGILE (see ATel #[1592](#)) and by the optical-to-radio observers of the GASP-WEBT Project (ATel #[1625](#)).

3C 454.3 has been detected on time scales of hours with high significance (> 5 sigma) by the LAT Automatic Science Processing (ASP) pipeline and the daily light curve ($E > 100$ MeV) indicates that the source flux has increased from the initial measurements on June 28. Although in-flight calibration is still ongoing, preliminary analysis indicates that in the period July 10-21, 2008 the source has been in a very high state with a flux ($E > 100$ MeV) that is well above all previously published values reported by both EGRET (Hartman et al. 1999, ApJS, 123,79) and AGILE (see e.g. ATel #[1592](#) and Vercellone et al. 2008, ApJ, 676, L13).

Because GLAST will continue with calibration activities, regular monitoring of this source cannot be pursued. Monitoring by the LAT is expected to resume in early August. In consideration of the ongoing activity of this source we strongly encourage multiwavelength observations of 3C 454.3.

The GLAST 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.



3C 454.3 [*Crazy Diamond*]

