IBIS/ISGRI STATUS

Philippe Laurent, Volodymyr Savchenko, Christian Gouiffès, Aleksandra Gros, Andréa Goldwurm, Aymeric Sauvageon

CEA/DRF/IRFU/Sap & APC

IUG 01/03/2017

ISGRI OPERATION

Operations

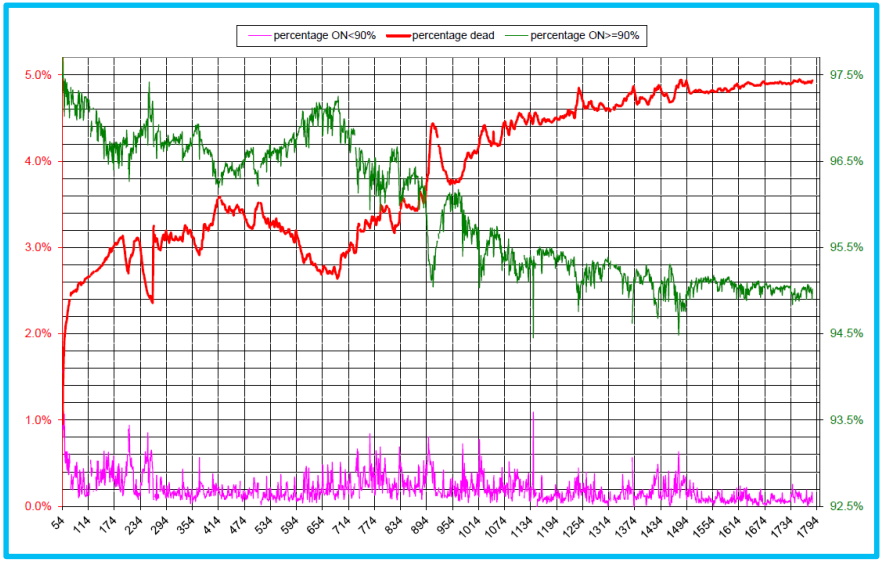
- Rare problems of dialogue between IBIS DPU and module 5 electronics (time-out for answer to HK request)

⇒ should be solved by the IBIS re-start done in orbit 1773.

- Same problem with module 7 was solved IBIS re-start in orbit 1155.

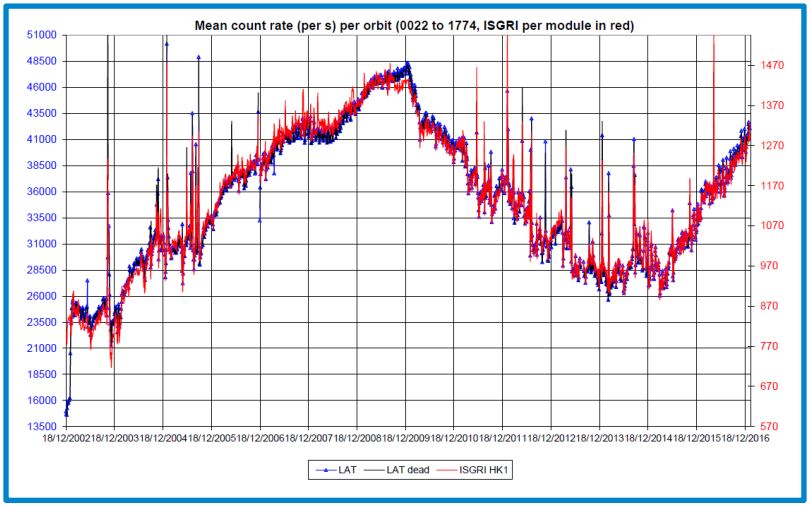
Dead pixels

The percentage of dead pixels is very stable now (just below 5%).



ISGRI/Veto Background

As solar activity goes to minimum, ISGRI raw count rate increases (due to cosmic rays increase, seen by VETO rate).



ISGRI CALIBRATION/ SOFTWARE

OSA11

- Presumably the last major update for ISGRI calibration
- OSA 11 (ISGRI) : new energy reconstruction + new background map
- OSA 11 delayed at APC/FACE due a hard disk problem.
- OSA 11 ready soon for delivery (see Carlo's presentation)

Changes in OSA11 /ISGRI

software

ibis_isgr_energy: disable drift correction (very small change)

ii_shadow_build: to compute LE efficiency, will read current gain information from LUT2, read resolution from current RMF

IC tree

Background maps, LUT2 (+ parameters for LUT1), ARF, RMF every month.

On-going imaging calibration

- Optimization of ghost cleaning (V. Savchenko, A.Gros)

  ⇒ due to mask rotation/stretch ?

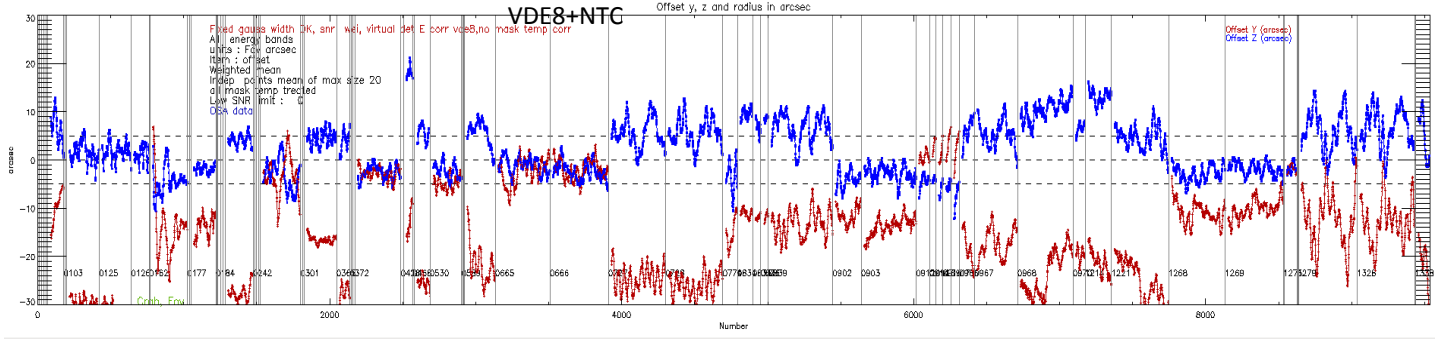
- Study of source position (A. Gros)

  ⇒ variation spring/ autumn
  ⇒ variation Crab/ other source
  ⇒ correction with « depth dependance method » / new mask model
  ⇒ Crab shift ?

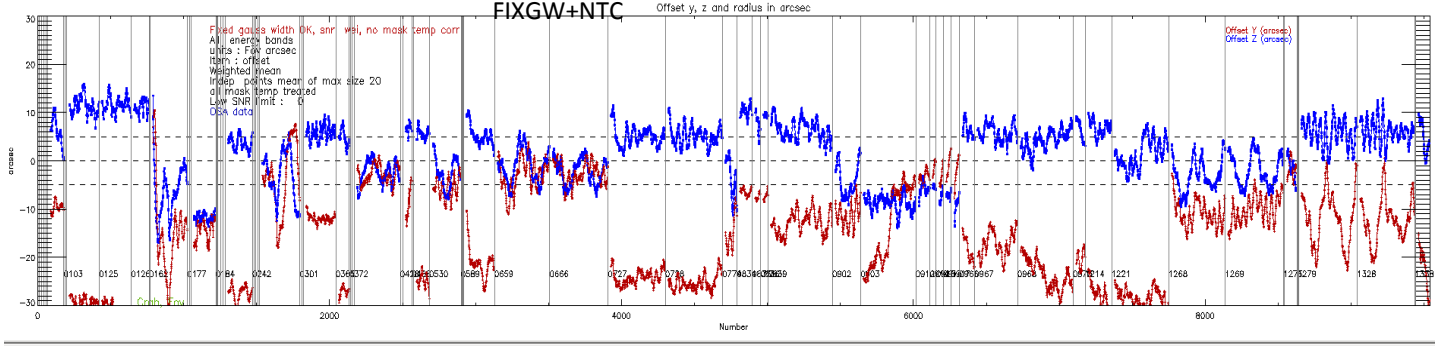
On-going imaging calibration

Crab:
Y offset vs 'time'
Z offset vs 'time

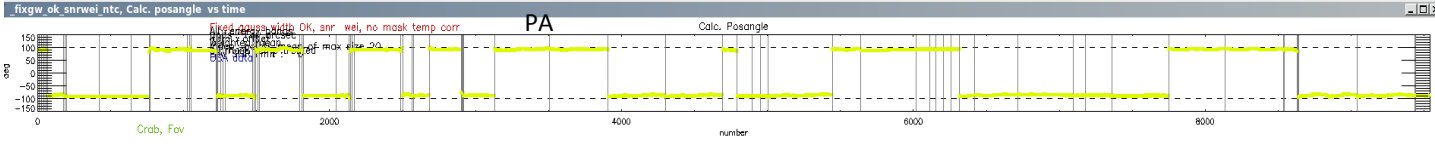
VDE8+NTC



FIXGW+NTC

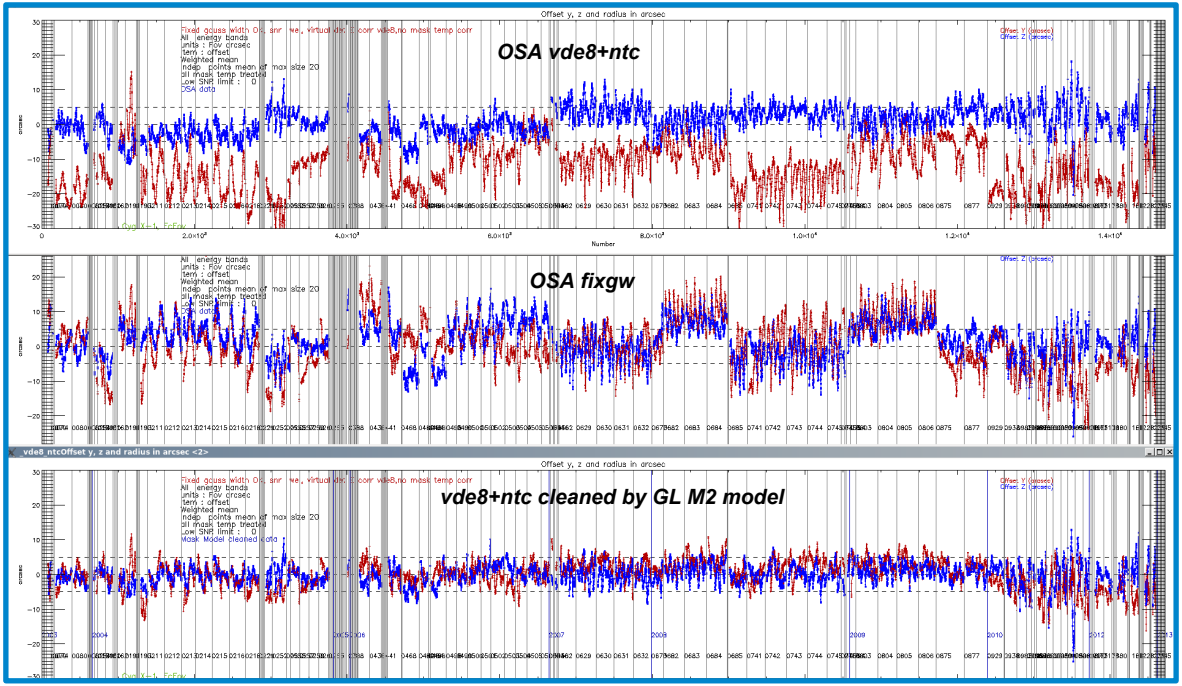


PA



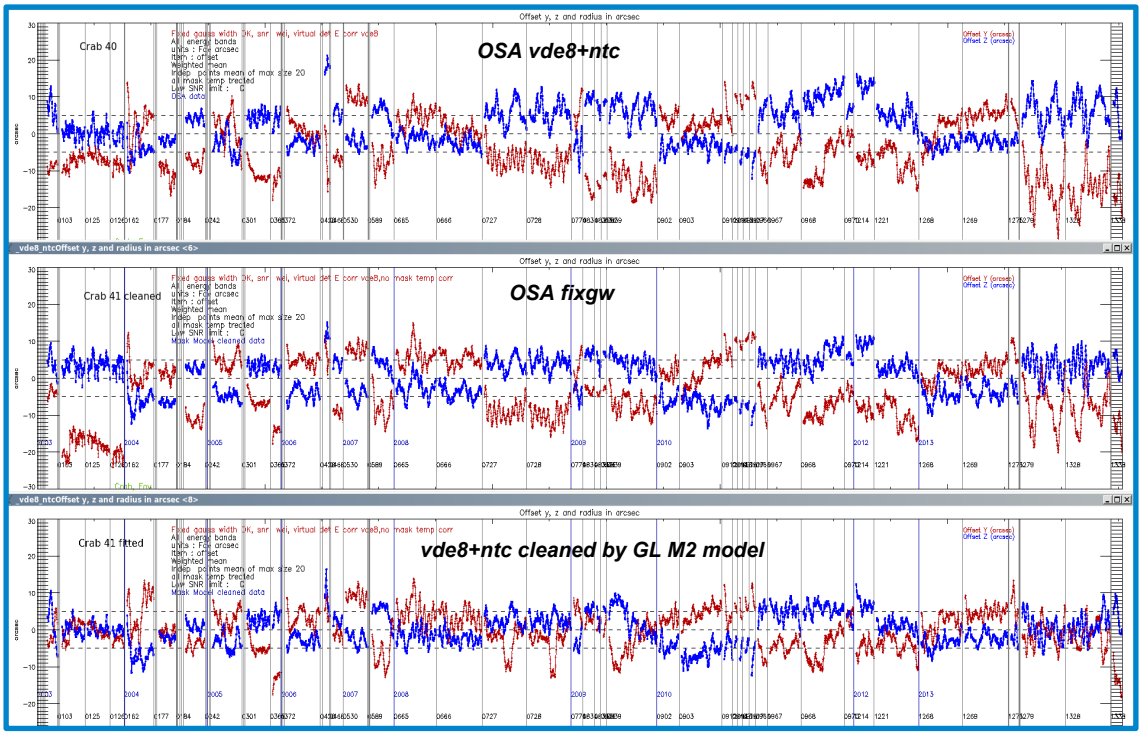
On-going imaging calibration

Cygn X-1 cleaned by GL M2 model



On-going imaging calibration

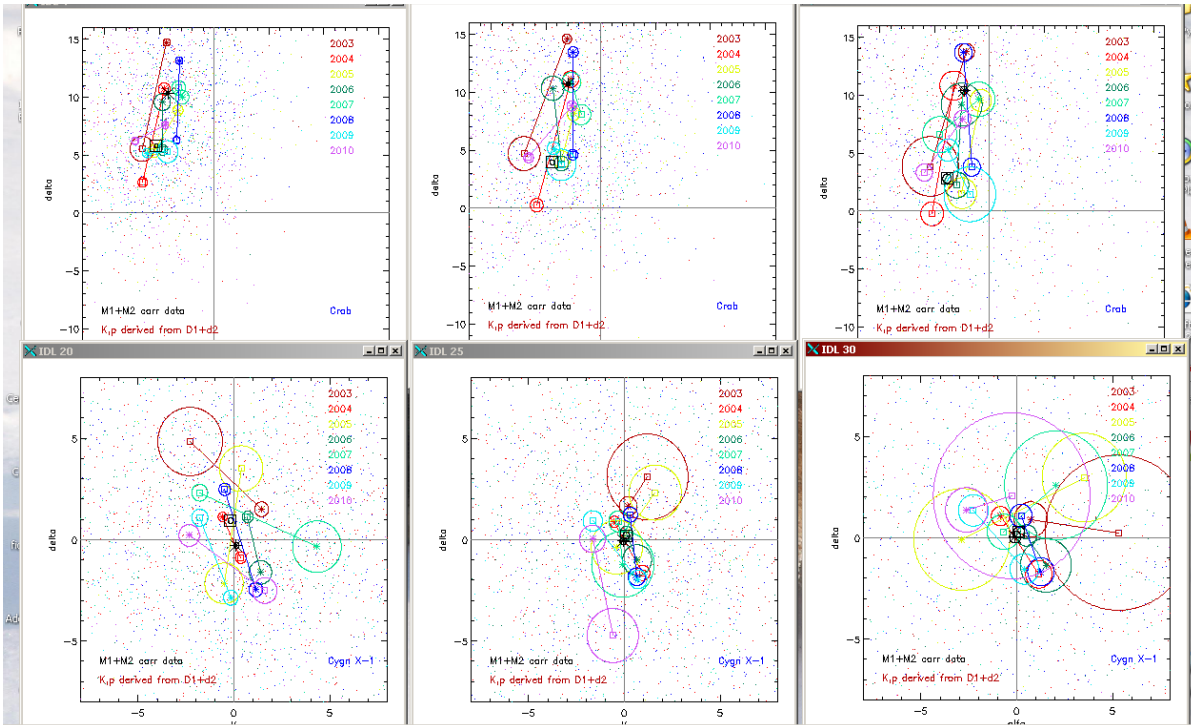
Crab cleaned by GL M2 model



On-going imaging calibration

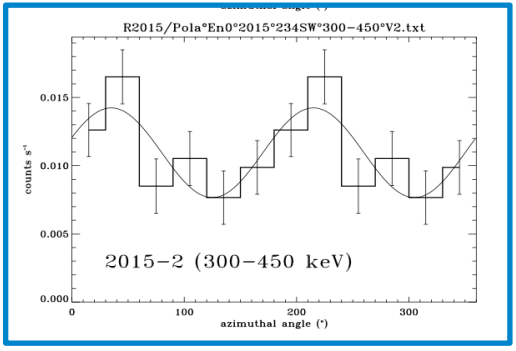
Crab and Cygnus X-1 cleaned by M1+M2

20 – 40 keV | 40 – 80 keV | 80 – 150 keV

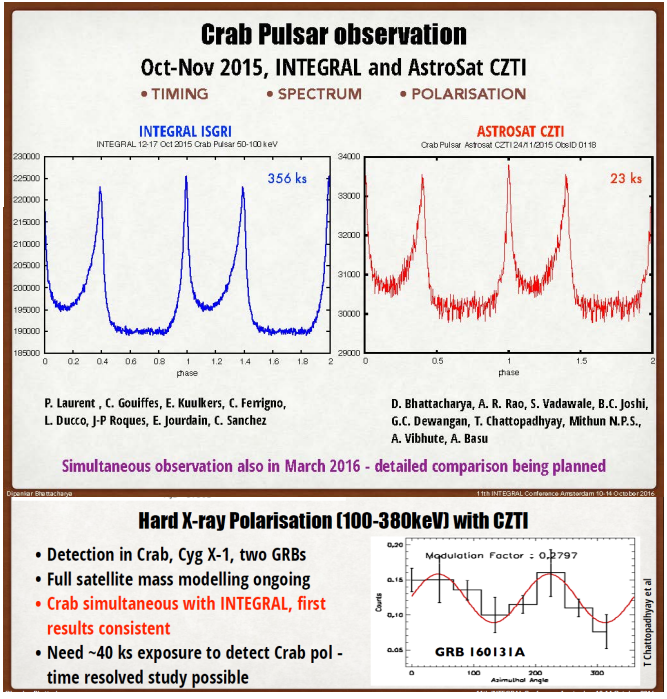


Integral – Astrosat cross calibration (Nov. 2015; Crab timing, polarimetry)

INTEGRAL	ASTROSAT (private communication)
300 – 450 keV	100 -380 keV
Θ = 125 ± 15°	Θ = 143.3 ± 6.4°
PF = 89 ± 28 %	PF = 31.7 ± 11.9 %



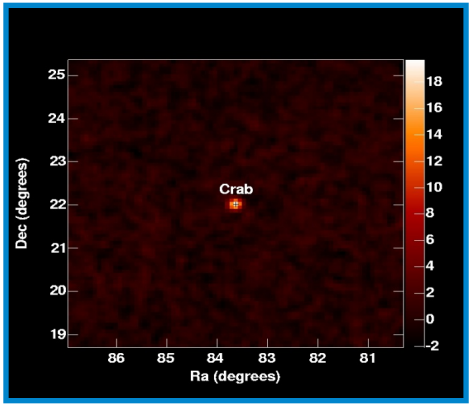
Gouiffès et al., 2016

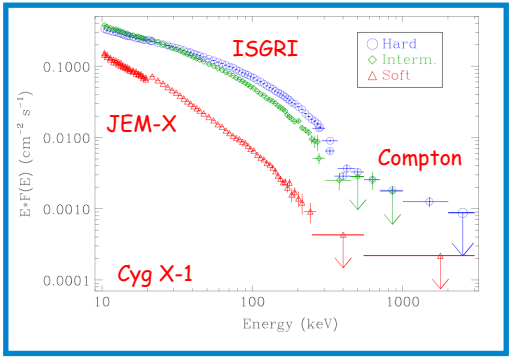


Bhattacharya et al., 2016

Compton mode data analysis

- We will deliver to ISDC Compton software to make images and spectra.
- Compton events energy will be computed along OSA 11 principles.
- Most of the software is similar to the ISGRI spectral-imaging data analysis.
- Only the software to remove spurious events is specific and has to be rewritten to be consistent with OSA.
- Delivery of updated response matrices and background maps may be also foreseen.

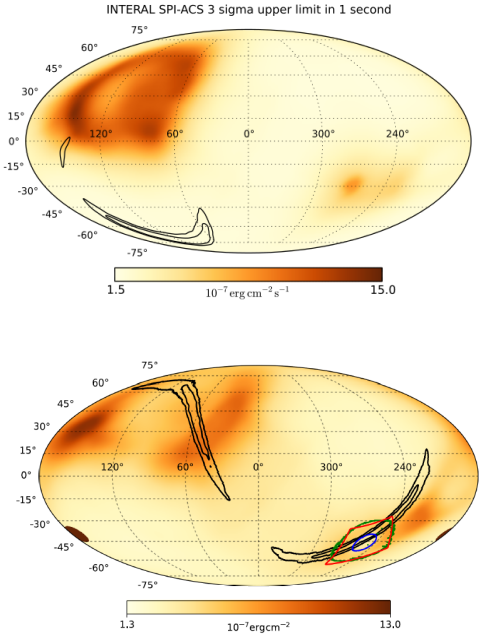




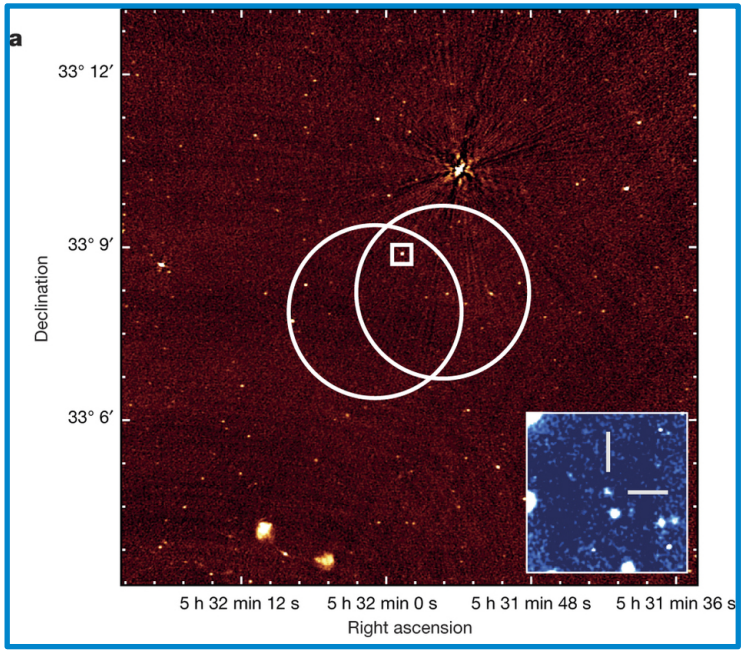
SCIENCE

Gravitationnal waves follow-up: main results in 2016

- Follow-up in the soft gamma-ray range by SPI ACS, and all other detectors onboard INTEGRAL (IBIS, PiCsIT, Veto).
- Publication by Volodymyr Savchenko of INTEGRAL SPI ACS upper limit on GW 150914 published (ApJL, 820, L36, 2016).
- Publication giving the INTEGRAL SPI, IBIS, and JEM-X upper limits on the LVT151012 event submitted (Savchenko et al. 2017).

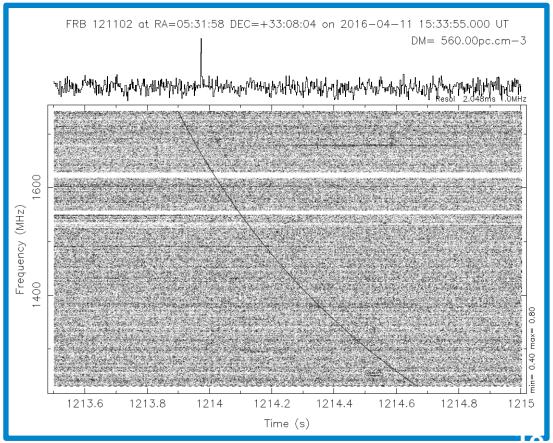


FRB 121102 news



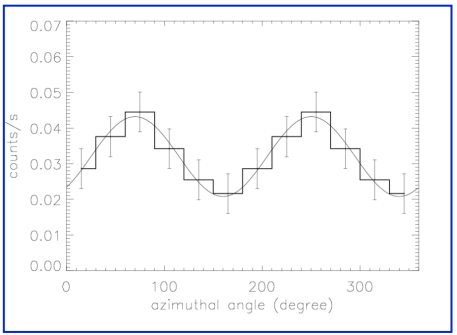
Radio and optical FRB 121102 counterparts (Chatterjee et al., Nature, 541, 58–61, 2017).

- 04/16 : FRB121102 also detected at Nancay !
- 11/16 : FRB γ-ray counterpart observed by Swift (FRB 131104).
- 01/17 : Detection of FRB121102 optical (Gemini) and radio (VLA) counterpart (pos. known within 20”).



γ-ray/ NIR polarimetric joint observations (1/2)

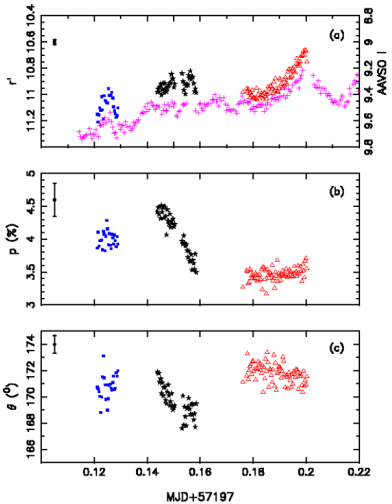
V 404 Cygni polarisation (γ-ray vs optical/NIR)



INTEGRAL/IBIS
June 2015 (1555, 149 ks of data) :
Θ = 160 ± 15°
PF = 95 ± 35 %

PF = 4% →

θ = 171° →



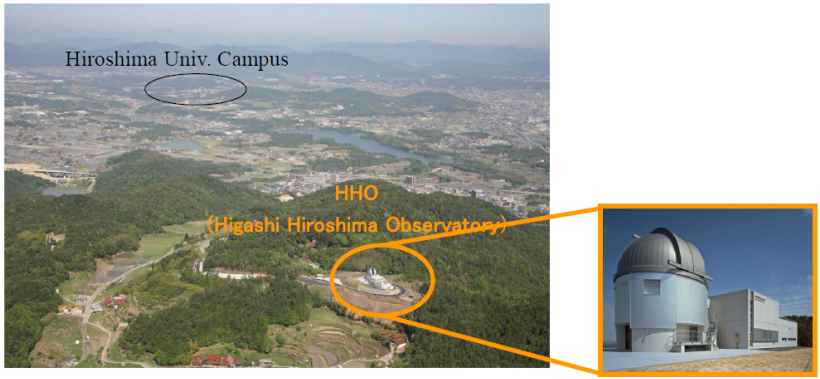
- INTEGRAL : detection only during rev. 1555 (MJD 57193 – 57195). detailed temporal evolution study on going …
- NIR : no detection at MJD 57193.5 – 57193.7 and 57194.5 – 57194.7 (Tanaka et al., 2017), but detection at MJD 57197.1 – 57197.2 (Shahbaz et al. 2016, θ = 171°)

⇒ Highly variable jet !

γ-ray/ NIR polarimetric joint observations (2/2)

- We have begun a collaboration with Hiroshima University (Kanata telescope with NIR and optical polarimeter) ⇒ joint proposal to INTEGRAL AO-15 for the follow-up of bright X-ray transients polarization.

- We have also contact to make, in the future, joint NIR and Optical polarimetric observation with SUBARU (8,2 m telescope at Hawaï).



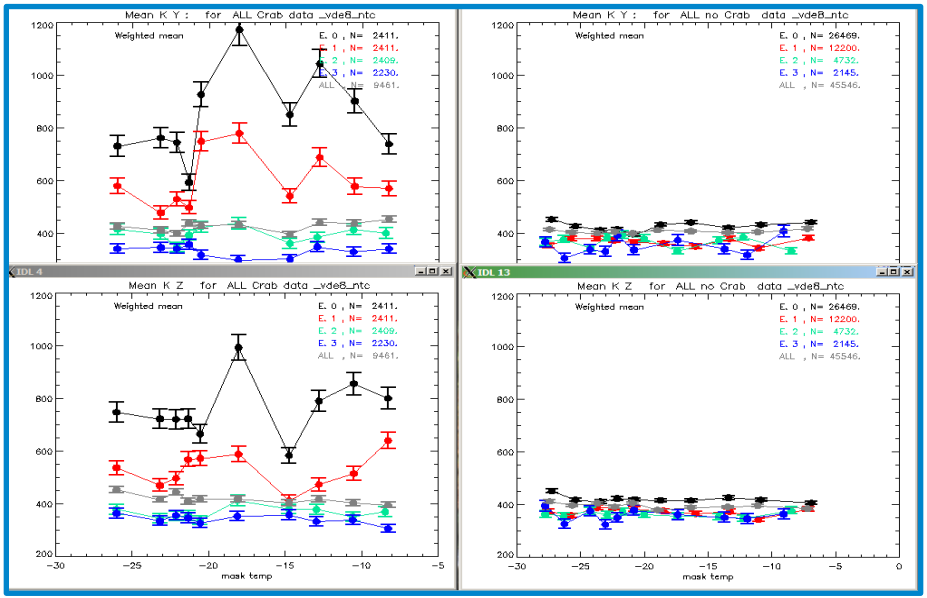
THANK YOU !

On-going imaging calibration

Comparison of offset distrib. Widths

Crab

No Crab



On-going imaging calibration

Crab shift

⇒ Calibration or knot ?