

IBIS/ISGRI STATUS

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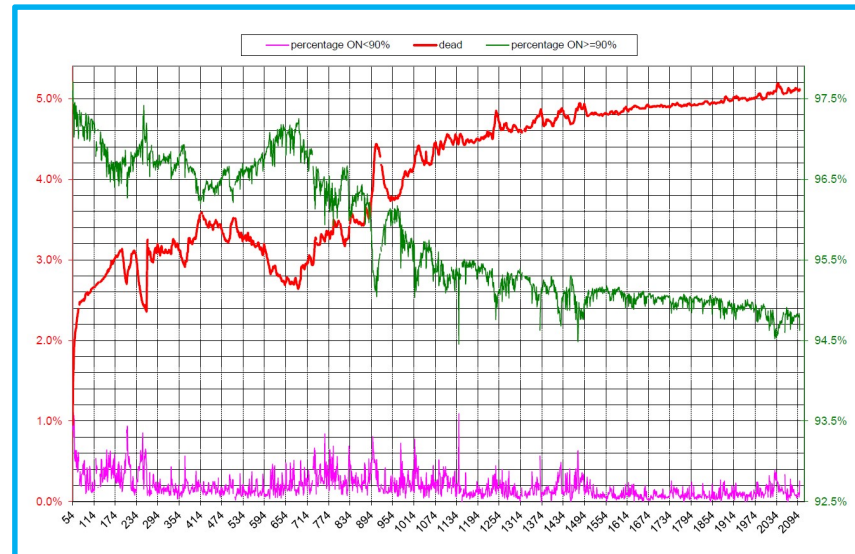
CEA/DRF/IRFU/DAP & APC

IUG#22 11/06/2019

ISGRI OPERATION

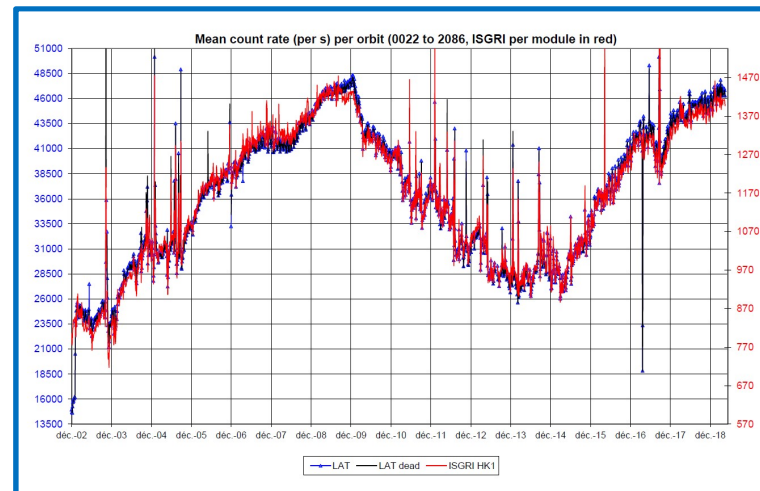
Dead pixels

The percentage of dead pixels is still very slowly rising (around 5%).



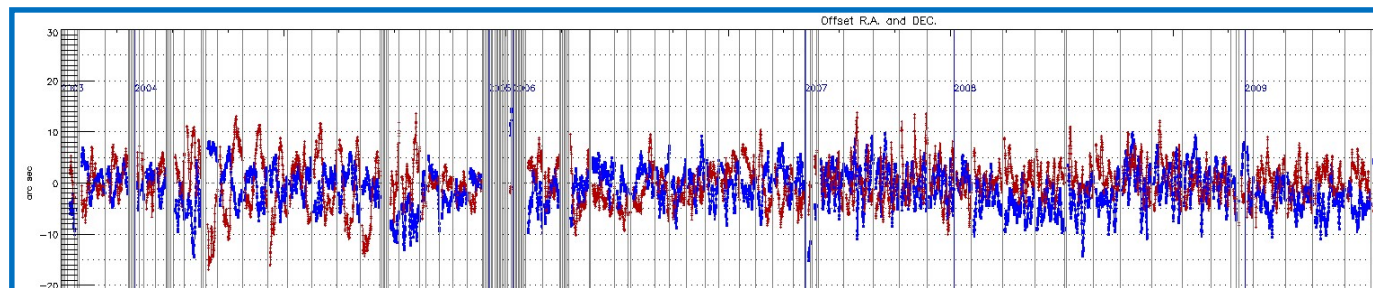
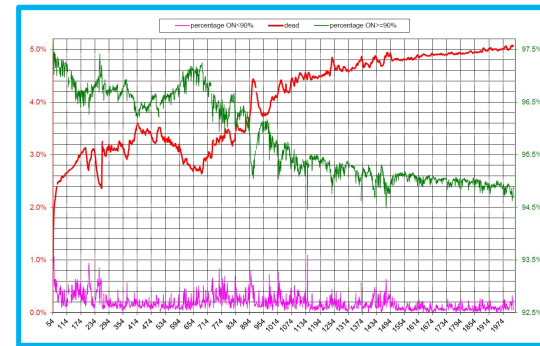
ISGRI/Veto Background

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



ISGRI follow-up at Geneva conference

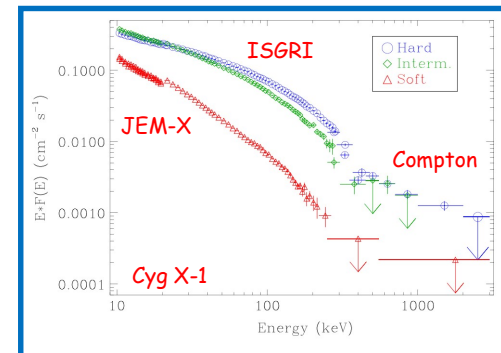
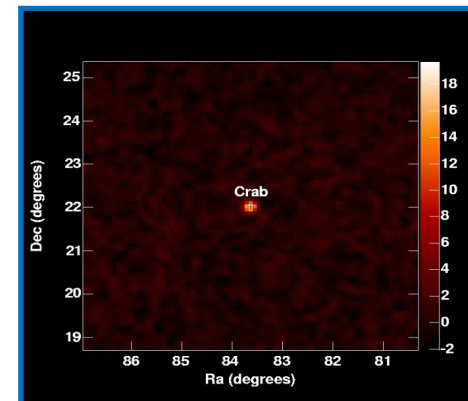
- Results on on-going ISGRI studies have been presented at the last Geneva conference :
 - Analysis of the IBIS/ISGRI systematic source location offsets** (A. Gros): mask quarter and photon absorption effect. Model OK for Cygnus X-1, not always on Crab.
 - ISGRI background evolution and noisy pixel handling** (A. Sauvageon). Description of the Veto system and of the NPHS which continuously monitors noisy pixels.



ISGRI SOFTWARE

Compton mode data analysis

- Delivery to ISDC of Compton software to make images and spectra is underway.
- Software is now ready at CEA, making all the steps from OSA11 ISGRI energy correction to mosaicking. We are testing it on Cygnus X-1.
- Before official delivery, we are ready to deliver to INTEGRAL teams who wish to do further testing.
- New ic_Mosalma and dal3ibis-calib to be delivered.
- Polarimetry is too complex to be delivered.



SCIENCE

Multi-messengers, polarization, compact objects

- On-going multi-messenger activity at Paris/Saclay.
- Several polarization studies are on-going :
 - Cygnus X-1 (Cangémi, F. & Rodriguez, J.)
 - V404 Cygni (Chang, B.)
 - GRBs (Götz, D.)
 - Crab (Gouiffès, C.)
- Ongoing observation campaigns on several sources : GRS 1915+105, Cygnus X-1, Cygnus X-3, ... coupled with Swift, NICER and HMXT.
- TOO On FRB 121102 (Gouiffès C.) and magnetars (Götz, D.).

June 11th 2019

FRB 121102

Meeting at APC on June 4th and 5th

Participants :

Laura Spitler, M. Cruces, Andy Shearer, Volodymyr Savchenko, Ismael Cognard, Laurent Philippe
Emeric Le Floc'h, Michel Dennefeld, Jérôme Guilet, Diego Gôtz, Stephane Corbel, Juilien Girard,
Fabrice Mottez, Anaëlle Maury Christian Gouiffès
Excused : Philippe Zarka, Jérôme Rodriguez

Support from PNHE (High Energy National Program) after answer to a call in late 2018



Two repeating FRB ...

INTEGRAL observations of the first two sources of repeating Fast Radio Bursts

AO17

PI: Christian Gouiffès

Cols: Ismael Cognard, Stéphane Corbel, Jean-Charles Cuillandre, Michel Dennefeld, Diego Götz, Philippe Laurent, Emeric Lefloc'h, Eoin O'Connor, Jérôme Rodriguez, Volodymir Savchenko, Andy Shearer, Laura Spitler, Philippe Zarka

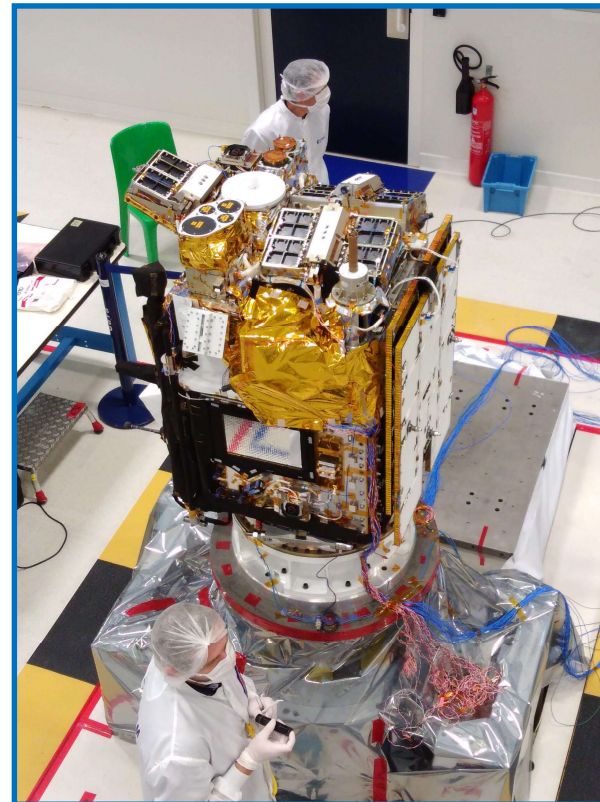
Abstract :

Fast radio bursts (FRBs) are bright and very short flashes of radio waves and form a new and enigmatic class of astrophysical transients. The number of fast radio bursts increased substantially in the last few months thanks to new operating facilities as CHIME, ASKAP and MeerKAT. Till recently, FRB121102 was the only FRBs showing a repeating activity with bursts indicating some clustering properties. The discovery among the first few CHIME/FRB of a second source of repeating FRBs, twice closer than FRB121102, suggest a substantial population of repeating object among the FRBs. We propose with this proposal to pursue our AO-16 ToO survey of FRB121102 (regularly observed with the Nançay Radio Telescope) and to add the new repeating FRB180814.J0422+73 among our potential target. Our programme will help to disentangle among the vast collection theoretical models so far proposed. These includes the collapse of an accreting neutron star (NS) or a black hole (BH), giant radio pulses from pulsars, giant flares from magnetars, NS-NS/NS-BH/BH-BH binary mergers or interaction of asteroids with a highly magnetized pulsar. Assessing the low and hard X-ray emission associated to our targets will tightly constrain the emission processes at play and the nature of the central engine powering these mysterious events, and provide clues on their interaction with the surrounding environment. Prompt observations with Arecibo and Effelsberg will corroborate the NRT monitoring and then secure a good temporal coverage during the high energy survey. In the case of FRB180814.J0422+73, we will tentatively trigger an observation in the case of recurrent radio activity, with clustered bursts not yet firmly established for this source. In total we request in total 3 orbits, assigned/shared between our two targets and spanned in time according to their radio activity.

TARANIS/XGRE: a GRB monitor ?

⇒ With a launch expected in **march 2020**, the **TARANIS** CNES microsatellite is dedicated to the study of transient radio, optical and gamma-ray phenomena observed in association with **thunderstorms**.

⇒ On board the spacecraft, **XGRE** is the instrument optimized to study terrestrial gamma-ray flashes (**TGF**).



TARANIS/XGRE: a GRB monitor ?

⇒ It will also detect **short GRB** and monitor **bright X-ray sources**, such as the Crab and Cygnus X-1.

⇒ GEANT4 Monte Carlo simulations of TARANIS/XGRE allowed us to estimate the sensitive area of the instrument. With an averaged effective area of **425 cm²**, XGRE should detect about **200 TGFs** per year

