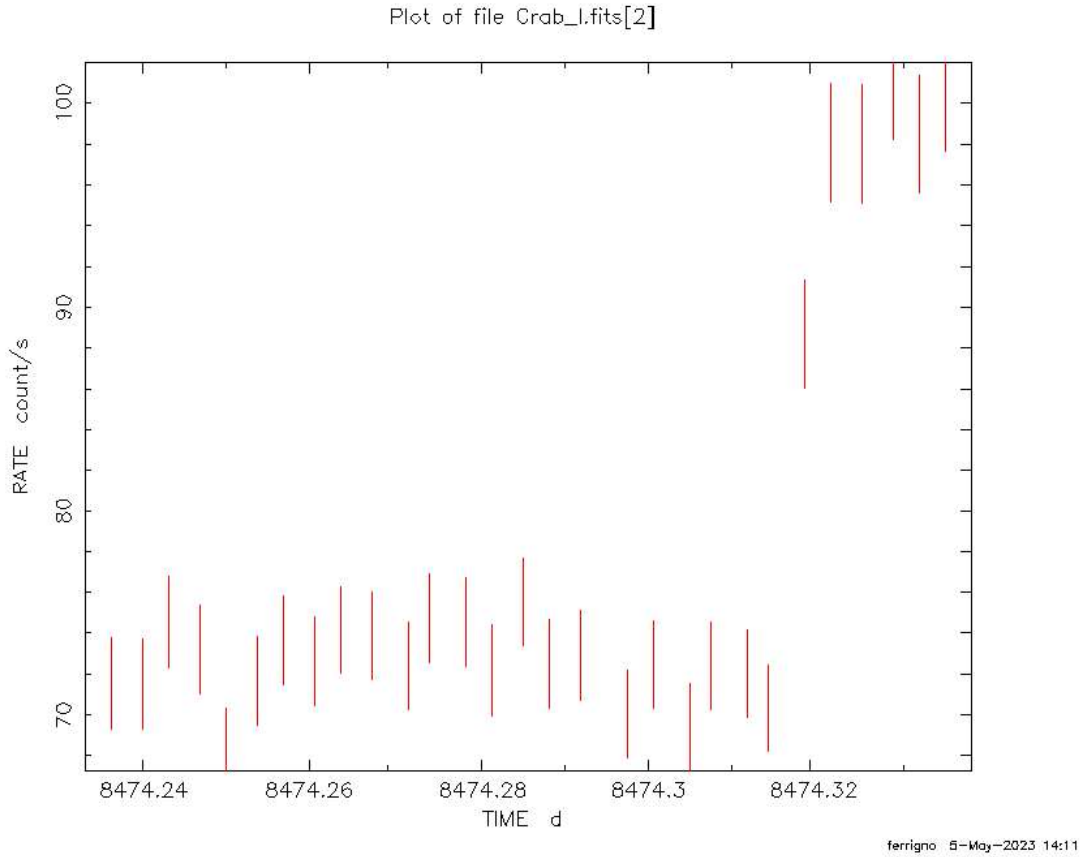
(Cross)Calibration activities

- We have setup a series of tests for consistency between SPI and NuSTAR with IBIS/ISGRI.
- Used for OSA11.2 testing
- They are all available online (protected)
- In principle, it is relatively easy to design cross calibration tests with different instruments:
- JEM-X and ISGRI are available online through MMODA
- SPI products can be provided for target sources
- Is it worth making more at this point?

Current ISGRI calibration needs update

- Issue with the Crab LC linked to new calibration in a not trivial way
- There is a drift of the Crab count rates that needs an update of the gain and response
- We have no manpower to perform this task : we might be able to open a temporary position in 2023-2024, but very difficult to find a suitable candidate



Multi-messenger activity (led by VS)

- There are proposals accepted by the TAC to define the boundaries of this activity and the composition of the team
- The idea is to have an impactful activity more than a voluminous activity.
- Eric Burns is using fast SPI-ACS data shared through MMODA to obtain triangulaition and will send IPN in real time
- Zoom meeting with collaboration to agree on what to do on Wednesday 17 May 2023 12:00 – 13:00. Shift team or not,which GCNs to send etc.
- Notices to be sent for every event. WIP because of no clear inteface to LVC and GCNs
- Scimma (NFC) or TNS alerts can be sent. VS made a bot for this.
- Dashboard to be resumed for internal usage. Difficult to allocate time.
- In general, less GCNs, more automatic notices.
- Matrix Chat Channel at the place of old Slack
- Talk to LVC seminar mid May by VS. Contact with Patrick Brady to show the possibility of doing fast triangulation and our plans for follow-up.

Multi-Messenger event dashboard

- Currently inactive
- Every input (GCN notice) is automatically processed and it generates results.

- Link to the workflows is private

Response to Legacy activity inputs

Calibration

- JEM-X calibration is continuously updated
- Some early products cannot be analyzed with OSA,
- ISGRI calibration needs an update.
- It will not require activity sigificantly after the end of the mission
- It needs somebody to work with VS before the mission is discontinued, maybe from Saclay side?
-
- It is a rather self-contained set of files which require just storage: they are publicly available

Science Window archive (level 2 data)

- We are programming to have a rev_4 ith legacy calibration
- To obtain high-level products, one needs still to run OSA
- With rev_4, we will be able to skip some preliminary space consuming steps (especially energy correction)

OSA present and future

- The OSA S/W is rather stable, but it can be maintained only in containers and/or virtual machines.
- Nobody will have the expertise to use it in the future
- Better to use a simplified version

(MM)ODA

- It is better to rely on a simplified version accessible via web services at the expense of full functionality
- This is available at ISDC, but it could be ported to ESA if the help of a system engineer and a scientist is given.
- A two-step approach has been proposed : 1. federate ISDC service using DataLabs 2. port the service to ESA using K8s clusters and HPC
- Not all functionalities of the back end have been made available on the frontend and API
- Possible to expand to OMC (and maybe pySPI)
- Critical need of manpower (1 bright person)

Legacy archive

- ISDC started a legacy standard analysis of all products per revolution (ISGRI and JEM-X)
- When a source is queried these products can be shown
- For each relevant source, we can make some highlight products (community can run this easily, I developed notebooks to do it)
- OMC light curves could be derived from the OMC archive, but we need programmatic access
- SPI needs discussion: either some static products are delivered to a repository, either a functionality to call the analysis online is implemented (Toulouse, Garching?)

Status and perspective

- ISDC together with APC, EPFL Swiss Universities has implemented the concept of a way to perform analysis online and provide also a good-looking gallery of products that is being currently populated
- Resources are limited and work is done in the direction of grants on Open Research Data, Knowledge graphs etc, which might provide an added value, but require additional effort
- ESA is producing some standard static products using science window processing and collecting them as done for HEAVENS.The added value is that is can be served through very effective graphical frontends.
- It would be essential to federate expertise and resources also from the PI teams to produce the most impacting products, but everybody works on its own ...

What is DataLabs (my take)?

- It is essentially a working environment where specific software can be used in connection with ESA archives
- However, you cannot think of running OSA inside, you need to wrap into services and interfaces. Usage is a significant technical challenge. VS participated in the early development.
- It is a significant effort, but similar things exist in every computing center or data center. For instance EPFL provides to all a platform from where softare can be installed and run in jupyter notebooks. CSCS is doing a jupyterhub for their users. Commercial provider do similar things.
- DtaLabs release has been delayed sine die.

Documents

- Making a significant effort on cross calibration now is prohibitive with the available man power, what is done is done.
- Data processing handbooks for OSA are stored in a gitlab repository that can be cloned and delivered to ESA. They are of limited usage for legacy.
- Documentation for (MM)ODA is largely insufficient and is unlikely to improve on its own, as the project needs to continuously evolve instead of being stabilized.
- University of Geneva has some funding for long-term preservation of archives. ESA should not worry at the moment.

Catalogs

- ISDC catalog is a working tool, not coming from original research
- We learned from Pietro that they are doing a final catalog combining BAT and IBIS.
- As for XMM, they come from scientific effort in the community.

Legacy phase

- It will always be necessary to maintain a part of expertise for the online analysis as infrastructure is evolving.
- All efforts can be done to be self contained, but something will need to be fixed.
- It is important to process most of the data to spot enough issues as long as expertise is available.
- It is indeed important to have a mix of static and dynamic products. It is even better if these products are linked to appropriate workflows to reproduce them, so that one can use them as a basis for re-analysis.
- Effective indexing using web-oriented technology is essential.