

ISDC for the INTEGRAL USERS GROUP

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10-11 May 2023

Organization status

- ↯ Swiss funding for 2023-2024: (not yet) approved with minimal direct funding (1.9 FTE, including sysadmin). Operations guaranteed.
- ↯ Contribution from ESA for operations, eroded by inflation and exchange rate (1.25 FTE).
- ↯ Synergies with other projects and past savings is essential.
- ↯ VS is only partially involved with INTEGRAL (25%), he's doing projects on data science and CTA.

Routine tasks

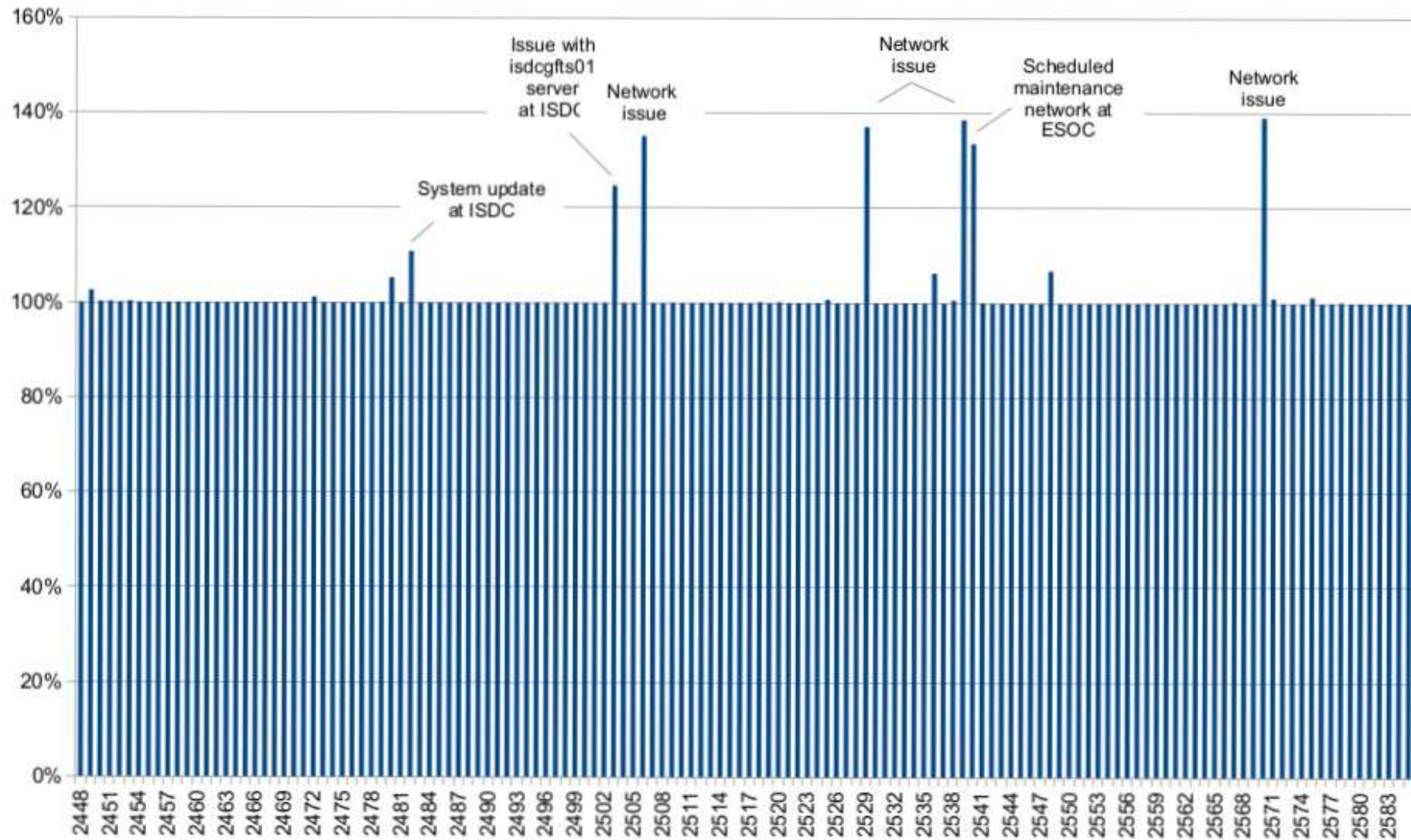
- ↵ Updates of IC files provided by instrument teams
- ↵ monitoring of SPI gain at each revolution with automated procedure (Lorenzo Ducci from Tuebingen)
- ↵ Processing and archiving of CONS data
- ↵ Generation of high-level product gallery

ISDC Operations/data distribution

- MMODA is widely used for SPI-ACS data in NRT
- MMODA and Gallery are becoming more as a reference for high-level products for non expert (MW teams)

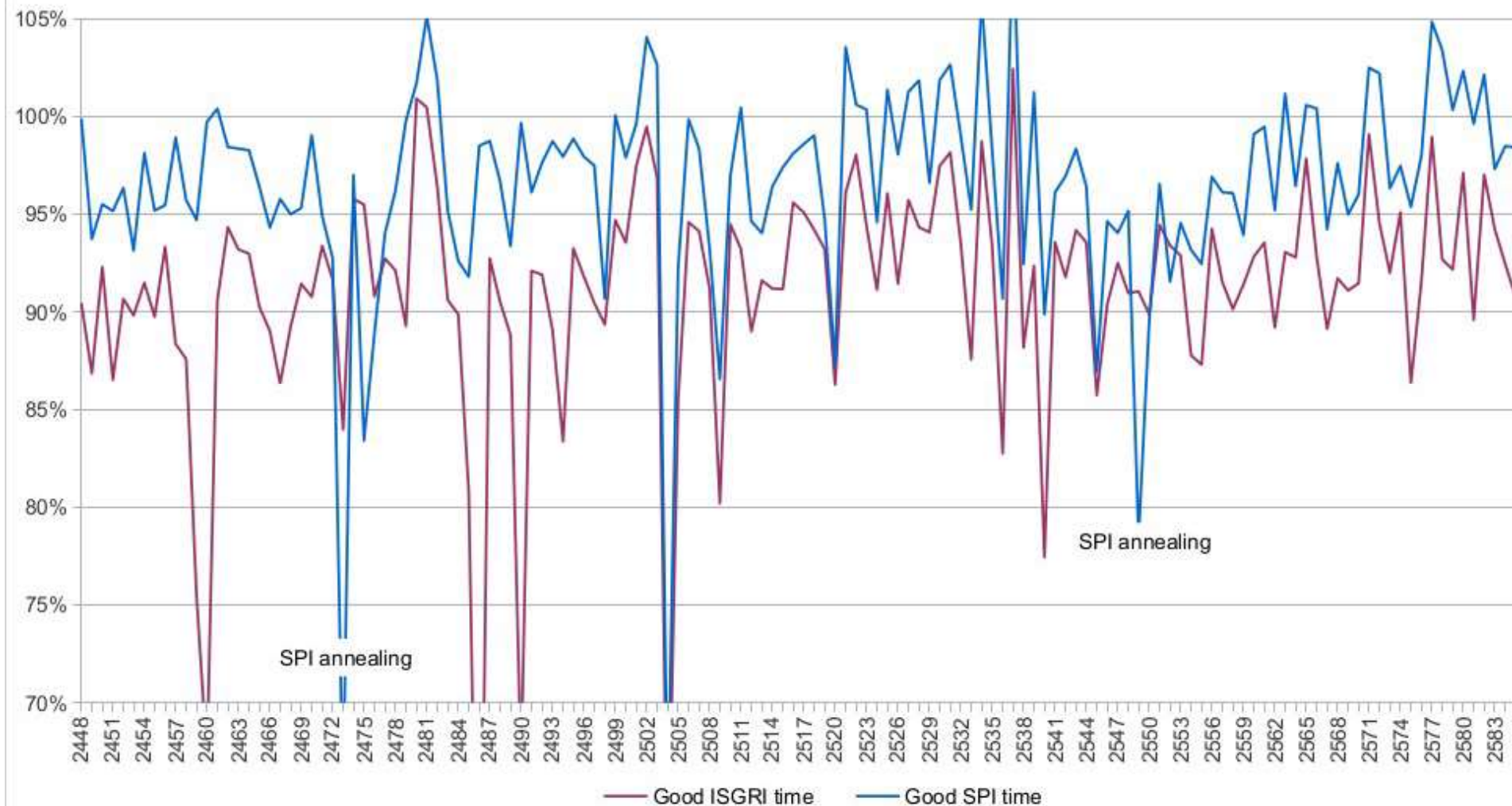
Telemetry

CONS / NRT, rev. 2448 - 2585



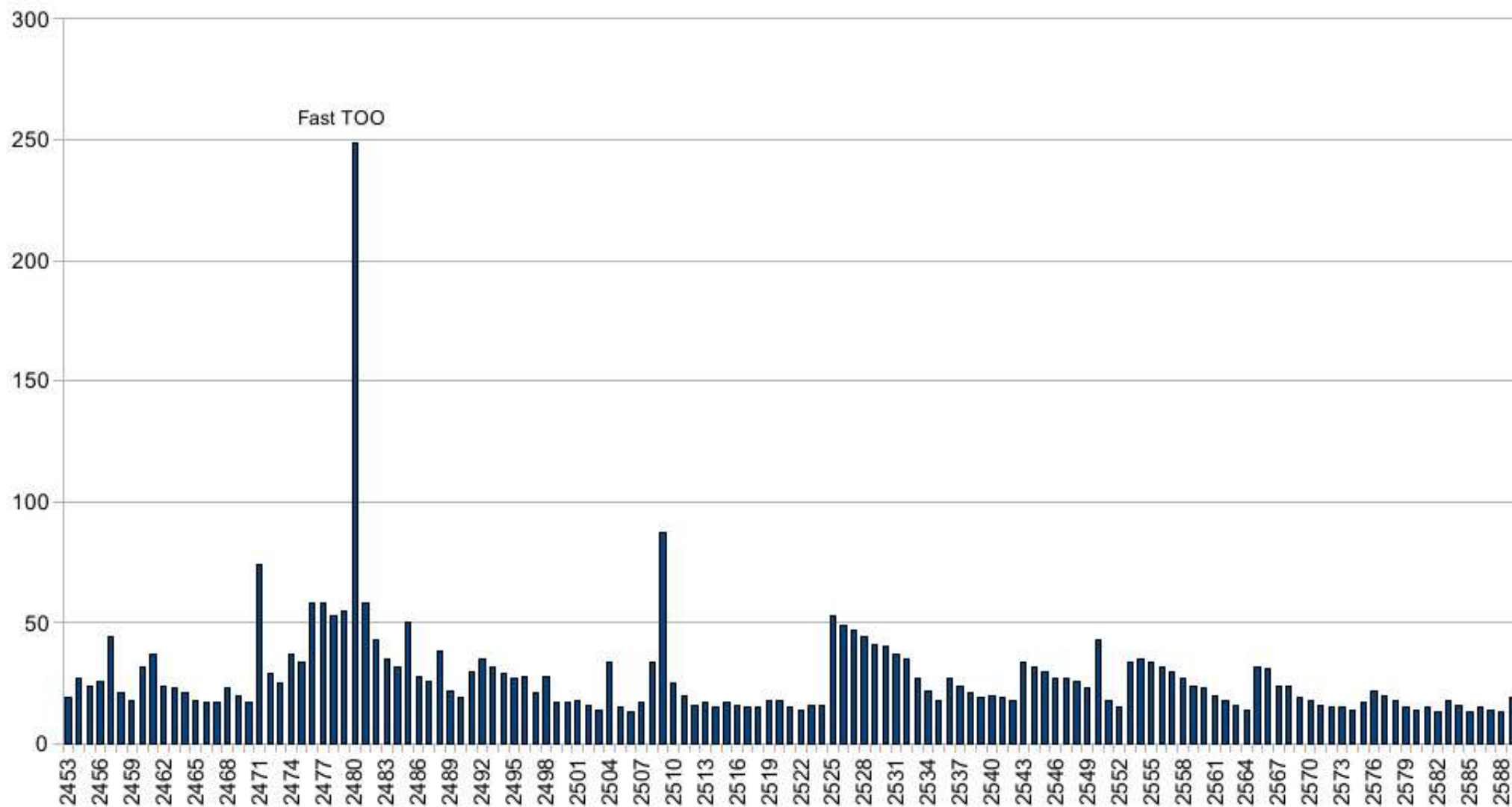
Operations: Good times vs Schedule

Operations : Good times, rev. 2448 - 2585

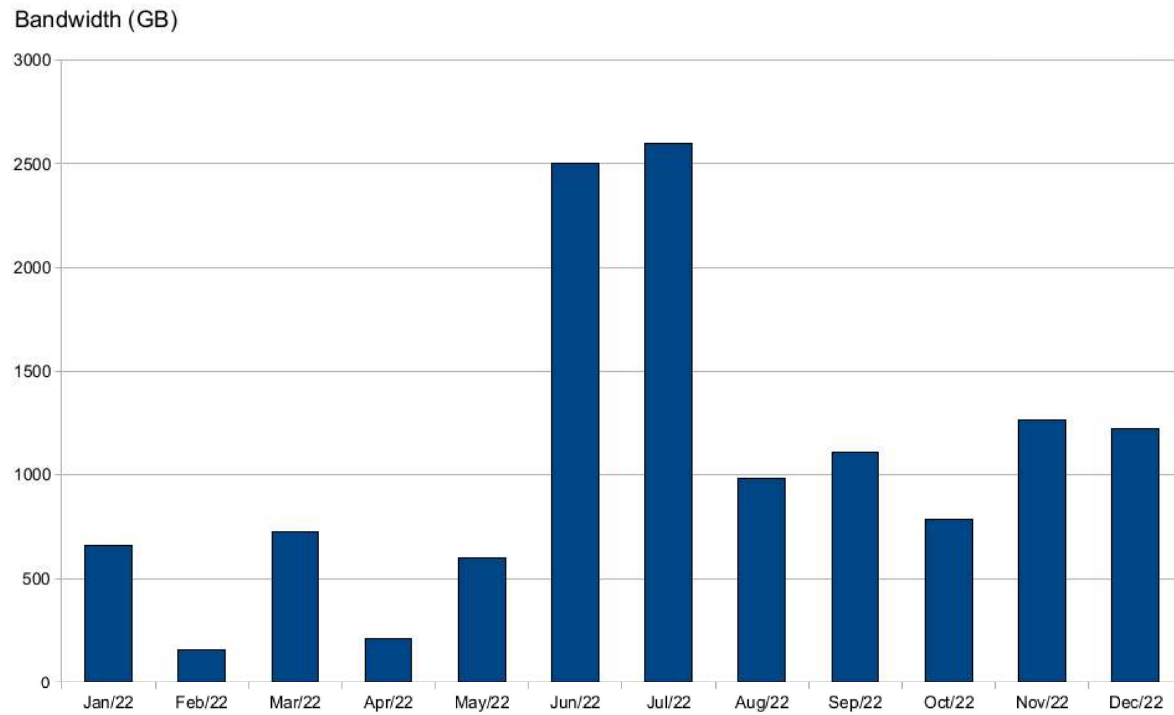


Delay between observation and distribution rev. 2453 - 2589

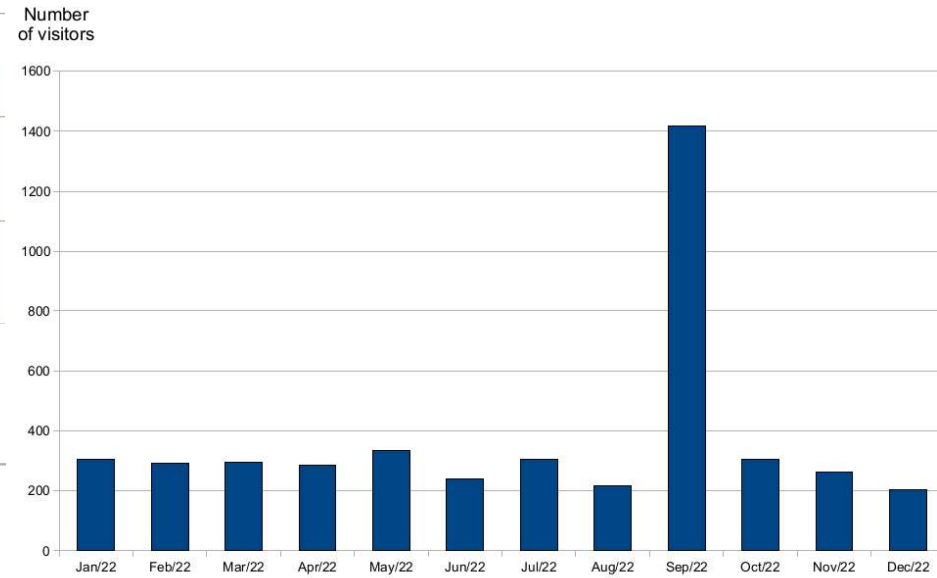
Number
of days



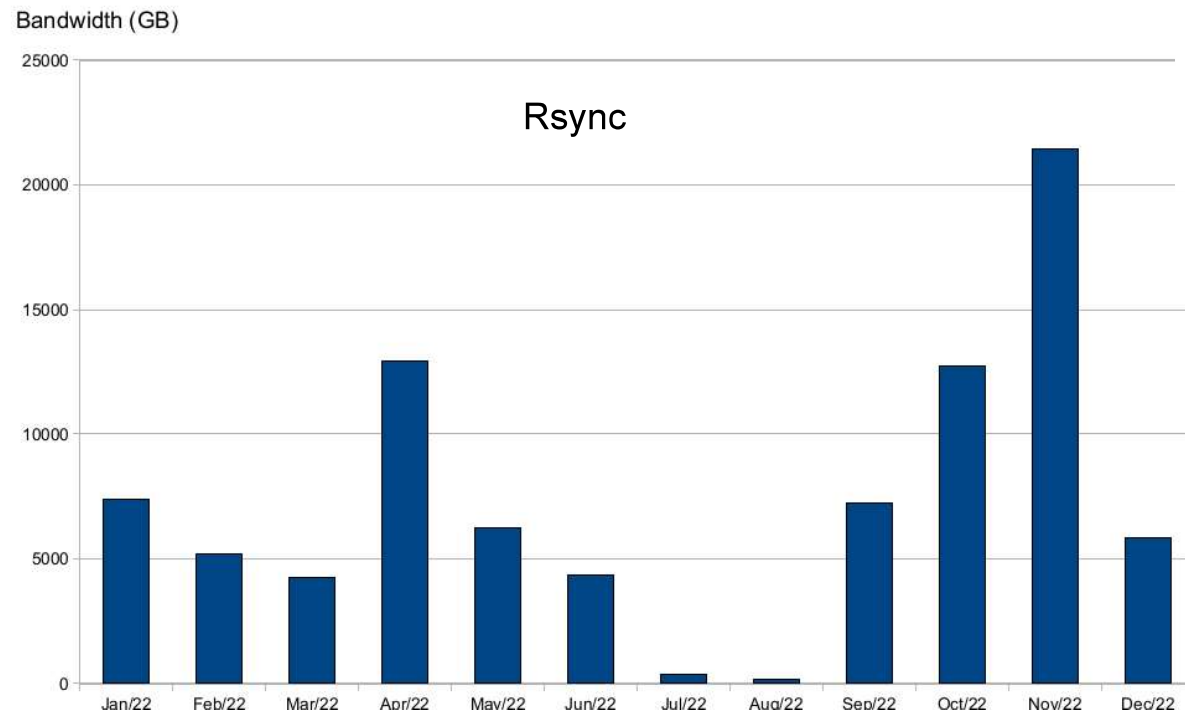
FTP access statistics



Browse unique visitors



Rsync



Multi-Messenger Offline Data Analysis (MMODA)

- We also run OSA executable from a web tool or python API (IBIS/ISGRI, JEM-X, and SPI-ACS)
- Fully linked to local HPC cluster

MMODA Multi-Messenger Offline Data Analysis | UNIVERSITÉ DE GENÈVE FACULTÉ DES SCIENCES | iSDC EPFL

My account | Sign out

List of known issues

Mon, Oct 25, 2021

We maintain list of known issues here: <https://github.com/oda-hub/known-issues>

List of known issues

API token | Contact us | Help

Object name *
1E 1740.7-2942 [Resolve]

RA *
265.97845833
The right ascension.

Dec *
-29.74516667
The declination.

Start time *
2017-03-06T13:26:48.0

End time *
2017-03-06T15:32:27.0

Time unit
ISO/IS

INTEGRAL ISGRI | INTEGRAL JEM-X | INTEGRAL SPI-ACS | Polar | Antares

Instrument query parameters:

OSA Version
OSA11.1

Radius
15 deg

Use INTEGRAL pointing Science Windows (ScWs)

☒ Select for time range ☐ Custom list

☐ Custom list in file

Maximum number of ScWs
50
randomly selected in the time range

INTEGRAL data access privilege

☒ Public ☐ All Private

Energy Min *
20 keV
The minimum of the energy band.

Energy Max *
40 keV
The maximum of the energy band.

Query Type
Real
Select query type:

Detection Threshold
7
Output catalog significance threshold

Product Type

☒ Image ☐ Spectrum ☐ Light curve
Select product type

User catalog

Browse... No file selected.
If needed, create a custom catalog following one of the templates: ASCII or FITS.

Submit

28 - 50 keV [2021.11.12]

J59 Download Ca x: 312.004 y: 361.123 value: -0.797

Log Share API code

Sig. Min: -6.29
Sig. Max: 36.71

Source: GX 1+4

normalised counts/s/keV

Energy (keV)

(data-model)/error

Energy (keV)

Exposure 11068.144531 (s)
Fit report for model powerlaw
energy range (30.0 - 300.0) keV



The MMODA product gallery



On these pages, we expose a collection of high-level products from the **INTEGRAL IBIS/ISGRI**, and **JEM-X** instruments.

These are obtained through the [MMODA online platform](#) through [dedicated workflows](#) developed by the [INTEGRAL Science Data Centre](#) experts. Our products are *images* for observations, *light curves*, and *spectra* for individual sources. They can be conveniently searched per source name, per satellite revolution, per instrument, time span, and other criteria. [Recent Near Real Time](#) data are conveniently displayed per satellite revolutions.

We welcome your feedback and wishes for products that are not yet available, [contact us](#) through our [MMODA platform](#).

Notes:

- the "source type" field is the classification provided by [Simbad](#)
- To reproduce the results using the [python API](#) to the MMODA service, please see [these instructions](#).

- An explorable collection of high-level products from the IBIS/ISGRI, and JEM-X instruments (for now) all the GRBs detected by BAT in SPI-ACS
- Hosted on a Drupal-powered website with full REST-API access for content creation, editing, and exploration.
- It is actively used to share NRT and CONS products



Legacy products as a gallery

- We made a study for legacy products triggered by ESA, we produce:
 - Standard products per each observation in each satellite revolution for Consolidated data: images for IBIS/ISGRI and JEM-X with source fluxes, spectra and light curves for each detected source.
 - Long-term light curve of each significantly bright source
 - Special products for sources: e.g. outburst light curve, spectra over longer campaigns will be provided
 - We are working on integration between Gallery and MMODA

Object name *

gx 1+4

Resolve

Explore

RA *

265.97845833

Dec *

-29.74516667

Start time *

2017-03-06T13:26

End time *

2017-03-06T15:32

Time unit

ISC

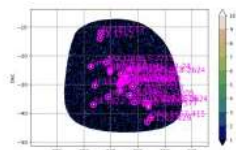
MMODA GALLERY - GX 1+4

Long baseline products

[GX 1+4](#)

Sources [1A 1742-294](#), [1E 1740.7-2942](#), 3...

Instrument isgri



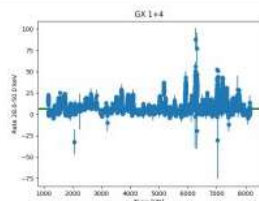
Data time span: 2005-05-01T00:00:00 -
2022-08-31T23:59:59

Revolution span: 311 - 2543

[GX 1+4 ISGRI lightcurve](#)

Sources [GX 1+4](#)

Instrument isgri



Data time span: 2003-02-01T00:00:00 -
2023-03-31T23:59:59

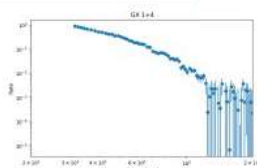
Revolution span: 36 - 2600

Highlights

[GX 1+4 ISGRI spectrum](#)

Sources [GX 1+4](#)

Instrument isgri



Data time span: 2020-02-08T09:07:24 -
2021-01-30T20:35:19

INTEGRATING Gallery with MMODA



Products per revolution

- For each revolution, we collect the observations and for each one, we build a mosaic, we select detected sources and we extract light curves and spectra for each of them.
- Effective Quick Look tool

Data Products per INTEGRAL revolution

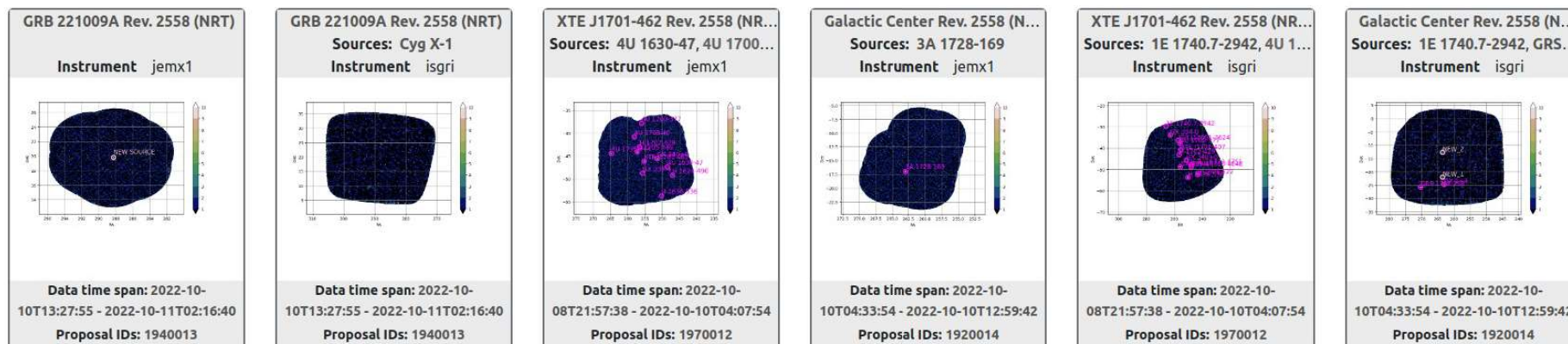
ISGRI
Jemx
Jemx1
Jemx2
All instruments

Provide a revolution number

Apply

Image
Spectrum
All products

2558





Population plan

- We process ~10-20 revolutions per day **running python notebooks as batch jobs.**
- We started from revolution 100 and arrived to 500 so far.
- We continuously process the last 10 revolutions ingested in the CONS archive to replace the NRT data
- From the sources detected on the timescale of a single observation within a revolution, we build a catalog of sources.
- We **WILL** use this catalog of sources to create light curves along the full mission.
- Every light curve could be periodically updated to have a real-time database, like Swift/BAT transient source page.
- We exploit the local HPC cluster for this purpose



INTEGRAL Sources

- Every source that is detected by ISGRI or JEM-X during at least in single observations appears in the Gallery.
- Search can be done also on source class: e.g. all blazars
- We (will) produce long-term light curves for most of them for reference and spectra on certain targeted intervals using a single catalog to optimize resources.

[All sources](#)
[Products per revolution](#)
[All products](#)
[Contact](#)

MMODA PRODUCT GALLERY

List of all sources

View	Edit	Grants	Delete	Revisions	Clone	Devel
Source name		Source type				
<input type="text"/>		<input type="text"/>				
Search within the list of available sources also with alternative names						
Source [▲]	RA	DEC	Source type	Online catalog		
1A 0535+262	84.727400	26.315800	HighMassXBin	🔗		
1A 1742-294	266.522000	-29.514800	LowMassXBin	🔗		
1A 1743-288	266.761000	-28.883000	LowMassXBin	🔗		
1E 1145.1-6141	176.869000	-61.953700	HighMassXBin	🔗		

Revision 4 with ISGRI calibration

- ISDC is working to be able to reprocess all data with the latest calibration. Solving some technical issues.
- This will allow us to skip the first three steps of the analysis COR GTI DEAD and save significant time for the Legacy science window archive