

The *INTEGRAL* Archive

Katja Pottschmidt

ISDC Data Flow
Archive Repository

Data Types

Groups & Indices

Data Access: Browse Demonstration

Data Installation

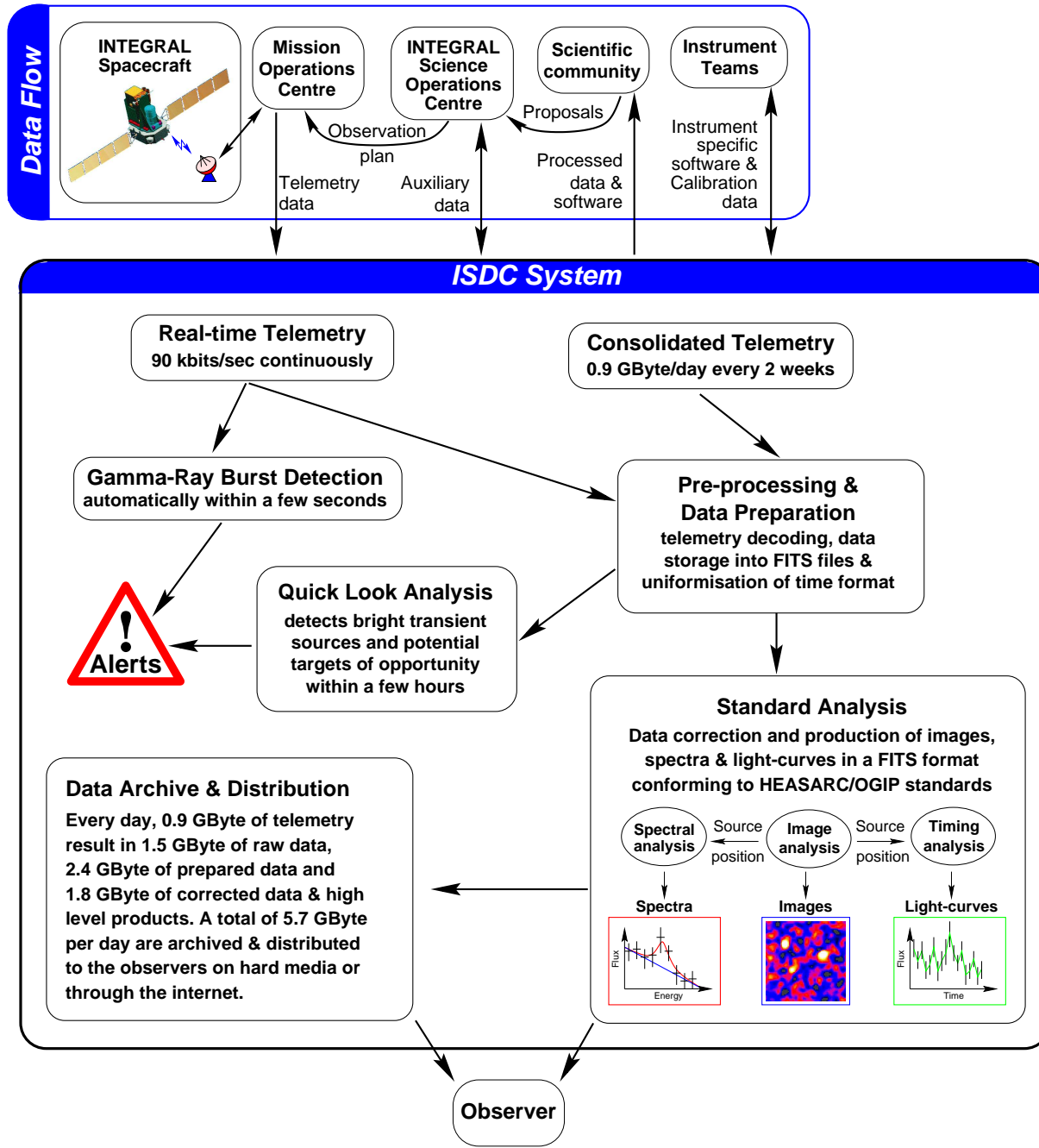
Preliminary Scientific Products

Outlook

Data Flow, I

— Teams: Pipelines, Shift, Archive, Hardware —

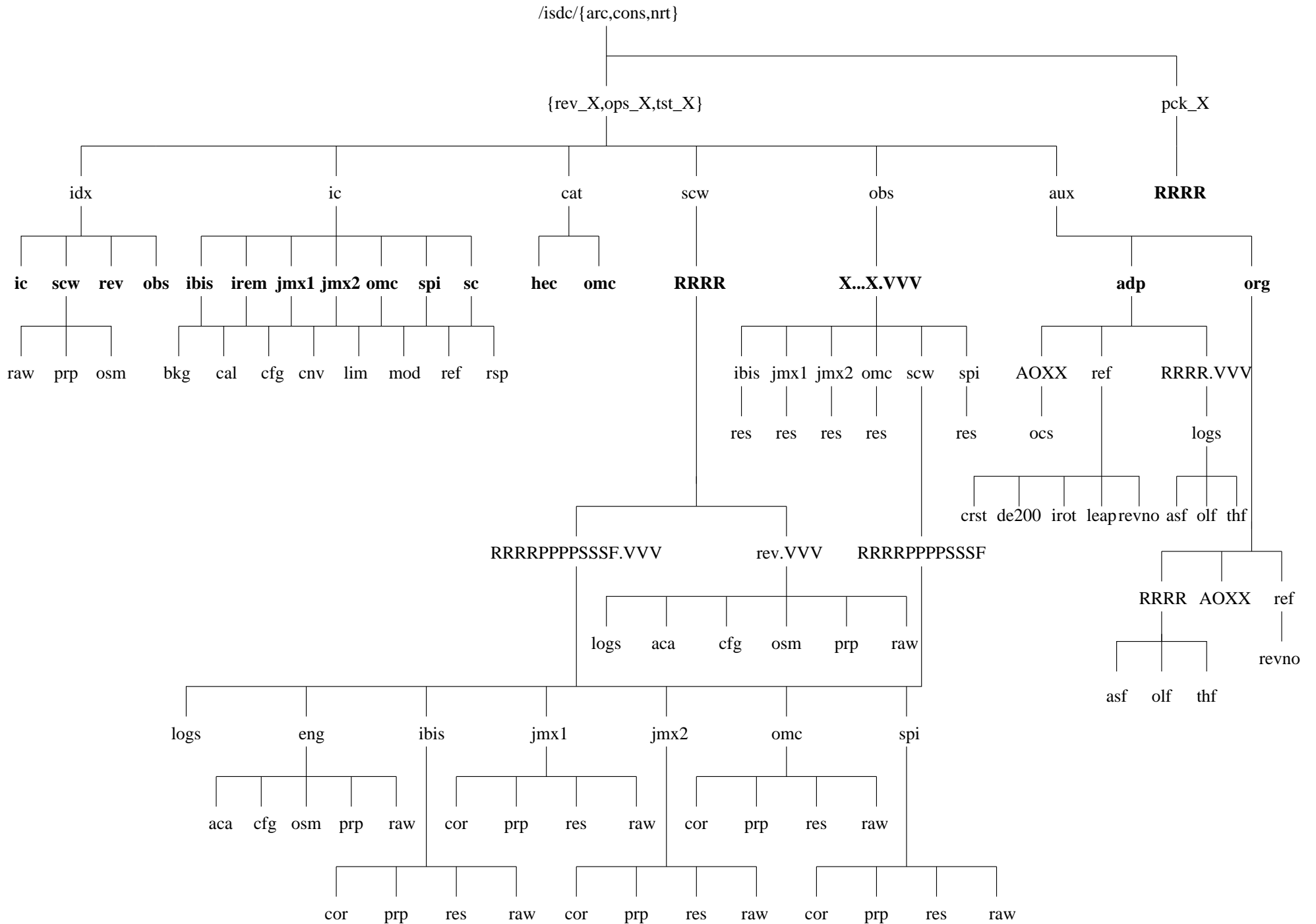
- ⇒ near-realtime – **NRT** – data are **not** archived
- ⇒ **archive consolidated telemetry** from CD-Roms sent by MOC
- ⇒ extract science windows – event data for typically 1.8/3.6 ks (**CONS pipeline**)
- ⇒ **archive science windows (SCWs)**
- ⇒ perform datarights updates – e.g., calibration is immediately public
- ⇒ check instrument good times / database consistency (ISOC/ISDC telecon)
- ⇒ produce science window lists for all pointed observations
- ⇒ perform standard analysis – create images etc. (**SA pipeline**)
- ⇒ **archive standard analysis results for all pointed observations**
- ⇒ perform distribution to the PIs, usual one-year proprietary period (**DD pipeline**)
- ⇒ regular backups



ISDC Archive Repository, I

- UNIX file system with FITS and ASCII files
- location of the archive at ISDC (“\$REP_BASE_PROD”):
/isdc/arc/rev_1 or /isdc/arc/rev_2
- “ISDC compliant **directory structure**” below \$REP_BASE_PROD:
looks the same in the archive and in your analysis
- data types: CAT, IC, AUX, **SCW**, OBS, IDX
- **2 revisions** of the ISDC archive:
 - currently the SCW data become **public simultaneously** in both
 - **OSA 4.0 ++ works on both**
 - the new revision 2 SCWs have a **simpler directory structure**:
 - *event processing levels (raw/prp/cor) have been combined
 - *all instruments in one subdirectory

Revision 1



Data Types, I

- **PCK** – private:
consolidated telemetry
- **CAT** – public: <http://isdc.unige.ch/index.cgi?Soft+download>
 - *high energy catalogue (“HEC”, **general reference cat.**) + OMC catalogue
 - *default input to OSA to identify sources
 - *upcoming version flagging sources seen by *INTEGRAL*
 - * HEC HTML version under icon “data” on ISDC web page
- **AUX** – public: [Browse – distribution I/F](#)
 - *auxiliary data (e.g., `time_correlation.fits`), needed by OSA
 - *full set corresponding to your SCW selection is provided (Browse-DD I/F)
- **IC** – public: <http://isdc.unige.ch/index.cgi?Soft+download>
 - *instrument characteristics (e.g., background maps), needed by OSA
 - *OSA finds the default versions of all IC files in `ic_master_file.fits`

Data Types, II

- **SCW** – proprietary period:

Browse – distribution I/F

- *data for a sub-observation of typically 1.8/3.6 ks
- *actually a science window **group**
- *made public by revolution (= *INTEGRAL*'s ~ 3 d orbit)

- **OBS** – private:

FTP distribution to the PIs

- *standard analysis (SA) results **on the basis of PI observations**
- *is also a **group**
- *currently: images
- *public SA results **on the basis of public SCWs** will soon be produced

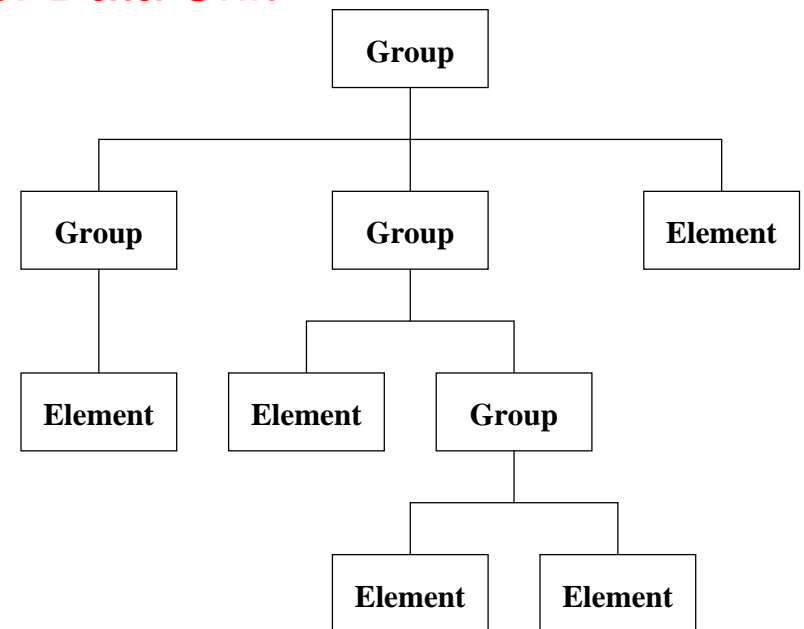
- **IDX** – public:

idx/ic: <http://isdc.unige.ch/index.cgi?Soft+download>

- *indices (and groups) **contain info about one or more files**
- *indices (and groups) are also present in other data types, needed by OSA
→ full set corresponding to your SCW selection is provided (Browse-DD I/F)

The Grouping Concept

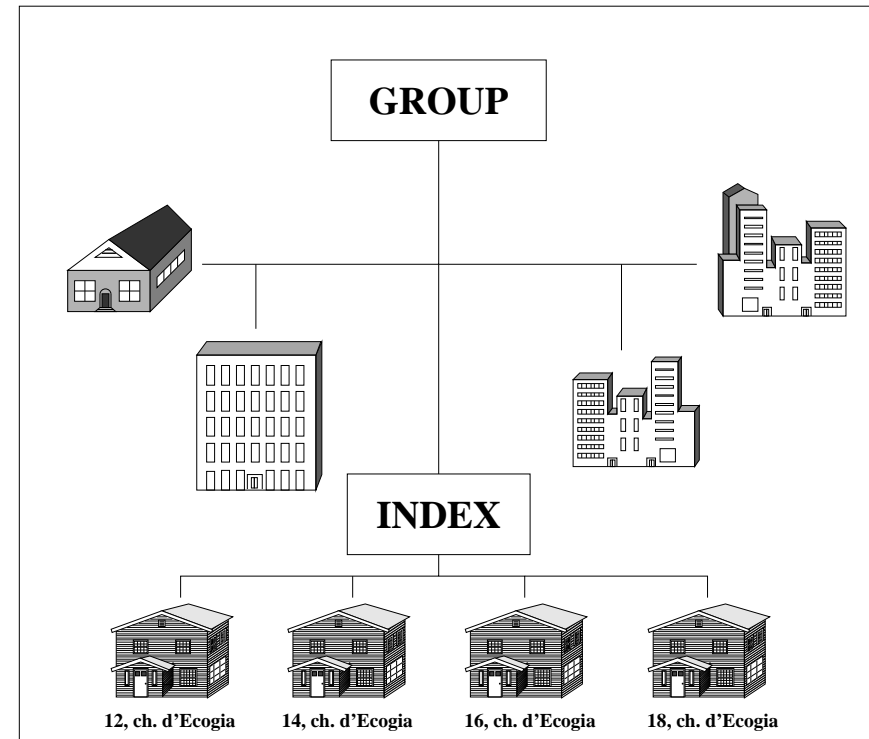
- **group**: association of one or more **groups** or **base elements**
- any group or element may belong to different groups simultaneously
→ groups may **share a given collection of data**
- a **group** is realized as a **FITS Group File**
- a **base element** is realized as a **FITS Header Data Unit**
- access: **Data Access Layer (DAL)** library, built on top of the **CFITSIO** library, this is used by **OSA**



The Index Group

The **index (group)** is an especially effective case:

- all index members belong to **the same kind of base element or group**
- easy realization in FITS:
group file with additional column(s)
listing keyword values for all members
- examples for groups and indices (on-line):
observation group
(with SCW group *index*)
IC masterfile group
(with *group* of IC indices & version *index*)



Data Access & Installation

Distribution of private data to the PIs:

- PIs receive e-mail with random path where to **download tar files via FTP**
- tar files contain OBS, SCW, and AUX data

Browse distribution of public data: <http://isdc.unige.ch/index.cgi?Data+browse>

- based on HEASARC Browse V7.0
- **Browse–distribution interface:**
 - make ScW selection —
 - “request data products” button —
 - provide your e-mail on interface page —
 - receive download script (“wget”) with download and installation instructions —
 - download and install (IC, CAT from s/w page) —
- **on-line demo:** Cyg X-1 SCWs, public, GPS, rev. 67, pointings only

FTP distribution of public data: <http://isdc.unige.ch/index.cgi?Data+ftp>

“Going Public” Dates

<http://isdc.unige.ch/index.cgi?Data+release>

- strategy:
 - *only complete revolutions become public
 - *sets of revolutions become public together
- Revision 1: Jul 19 – Oct 4 → 103 w/o 100, 079 – 88
 - Oct 18: 079, 080
 - Nov 01: 097, 101, 116 – 118
 - Nov 19: 098, 099, 104 – 106, 109, 119 – 122
 - Dec 10: 107, 108, 110 – 115, 130
- 081 – 088 beginning of 2005 Jan (late CONS delivery)
- Revision 2:
 - Sep 27: 026 – 078
 - Oct 18: from this day onwards identical to revision 1

Preliminary Scientific Products

- collaborative effort of the **ISDC** and the **GSFC**
- **ISGRI** (A. Paizis) and **SPI** (V. Beckmann) OSA 4.0 results for the public data
- based on revision 1, semi-automatic analysis
- “**Bright Source Catalog**”: 62 sources
fluxes per ScW (SPI 20–40 keV, ISGRI 6 bands)
- “**Public Data Results Catalog**”: per revolution and targets therein
OSA image fits files, 20–40 keV .jpg significance images
- **Availability:**
Bright Source: <http://isdc.unige.ch/index.cgi?Data+sources>
Both: **HEASARC Browse**

Outlook

- future **archive of scientific products** based on **SA runs on SCW basis** decoupled from the observation based ones for PI distributions (SPI remains at observation level or equivalent)
- **new directory structure** defined for archiving the SCW SA, is now being implemented (`rev_2/obs_{inst}/RRRR.VVV/sa{inst}_scw_{SCW_ID}/`)
- SCW standard analysis up to images is planned to start 2004 Nov.
- SCW standard analysis will be basis for **higher level products:**

Browse (thumbnail) images for each SCW in standard energy bands

archived table storing the detected sources and their fluxes for all SCWs

...