18th AGATA Week

Towards The NEDA/DIAMANT campaign, and The processing of GRETINA data

O. STEZOWSKI - 11-15 September 2017
Milan, Italie

Institut de Physique Nucléaire de Lyon

OUTLINE

Some general remarks

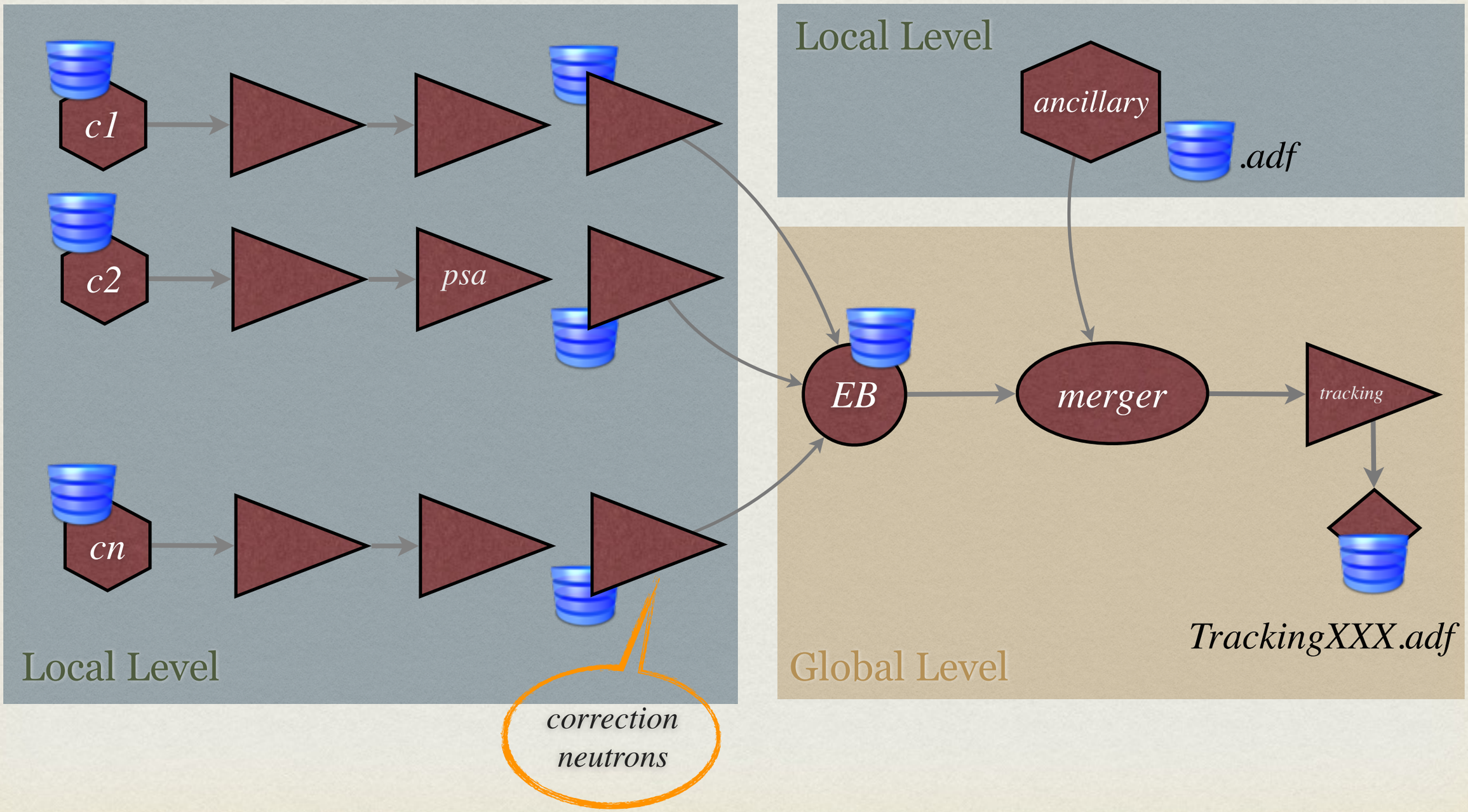
NEDA
DIAMANT

GRETINA
in AGAPRO

Conclusions

SOME GENERAL REMARKS

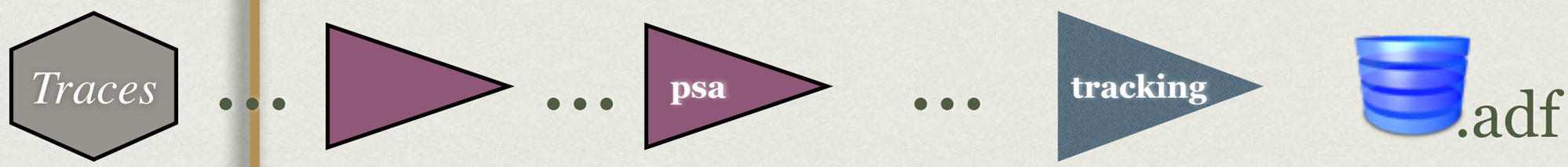
PSAXXX.adf : list of hits



SOME GENERAL REMARKS

The main goal is to have processed data from AGATA [Traces ☛ Tracked]
and the ANCILLARIES [adc/tdc ☛ …]

Raw Data



Pre-analysis [calibration] = processing

AGAPRO

Many steps,
requires complex software

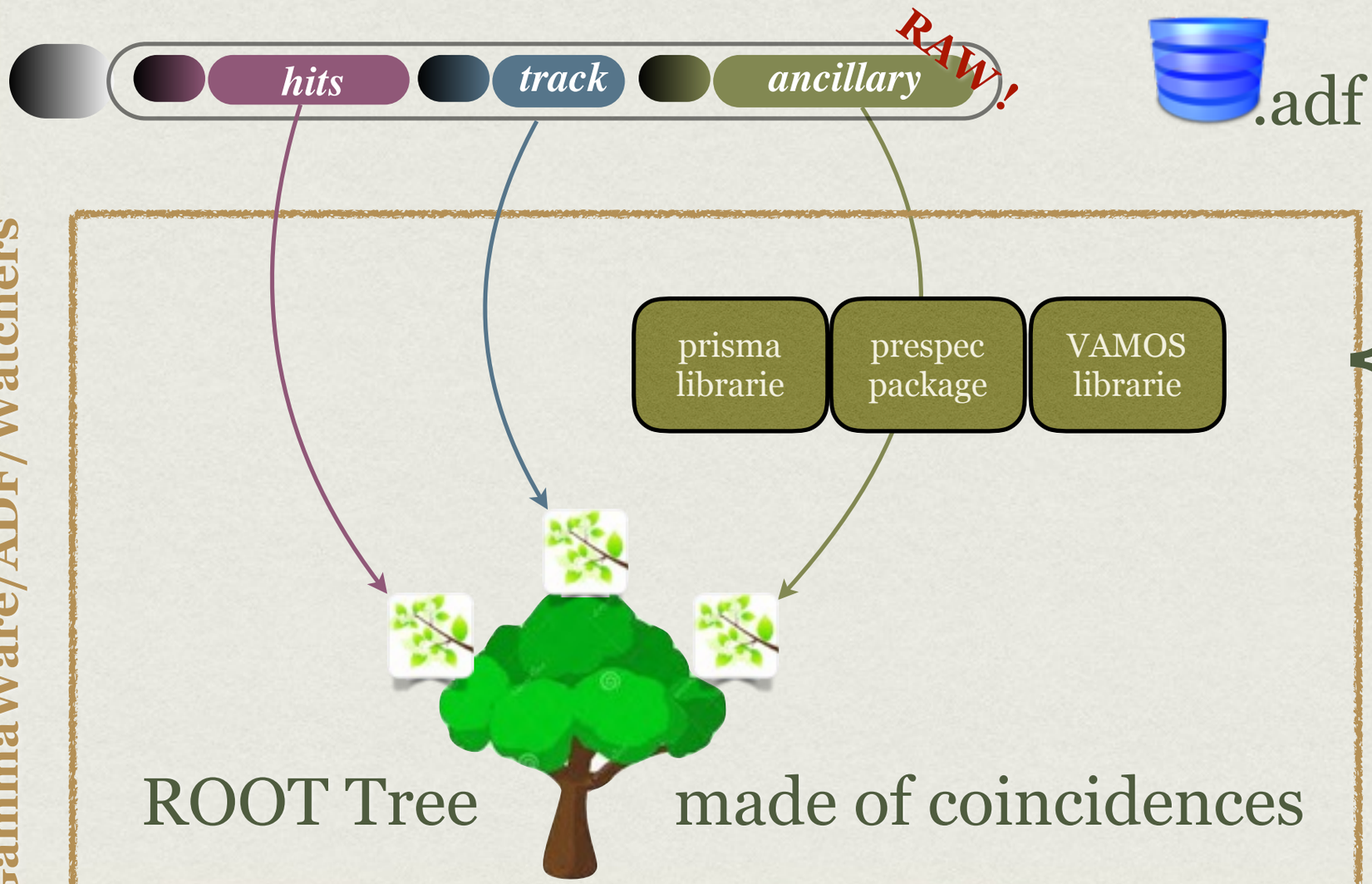
One step,
may require complex software { PRISMA, FRS, VAMOS

adc
tdc

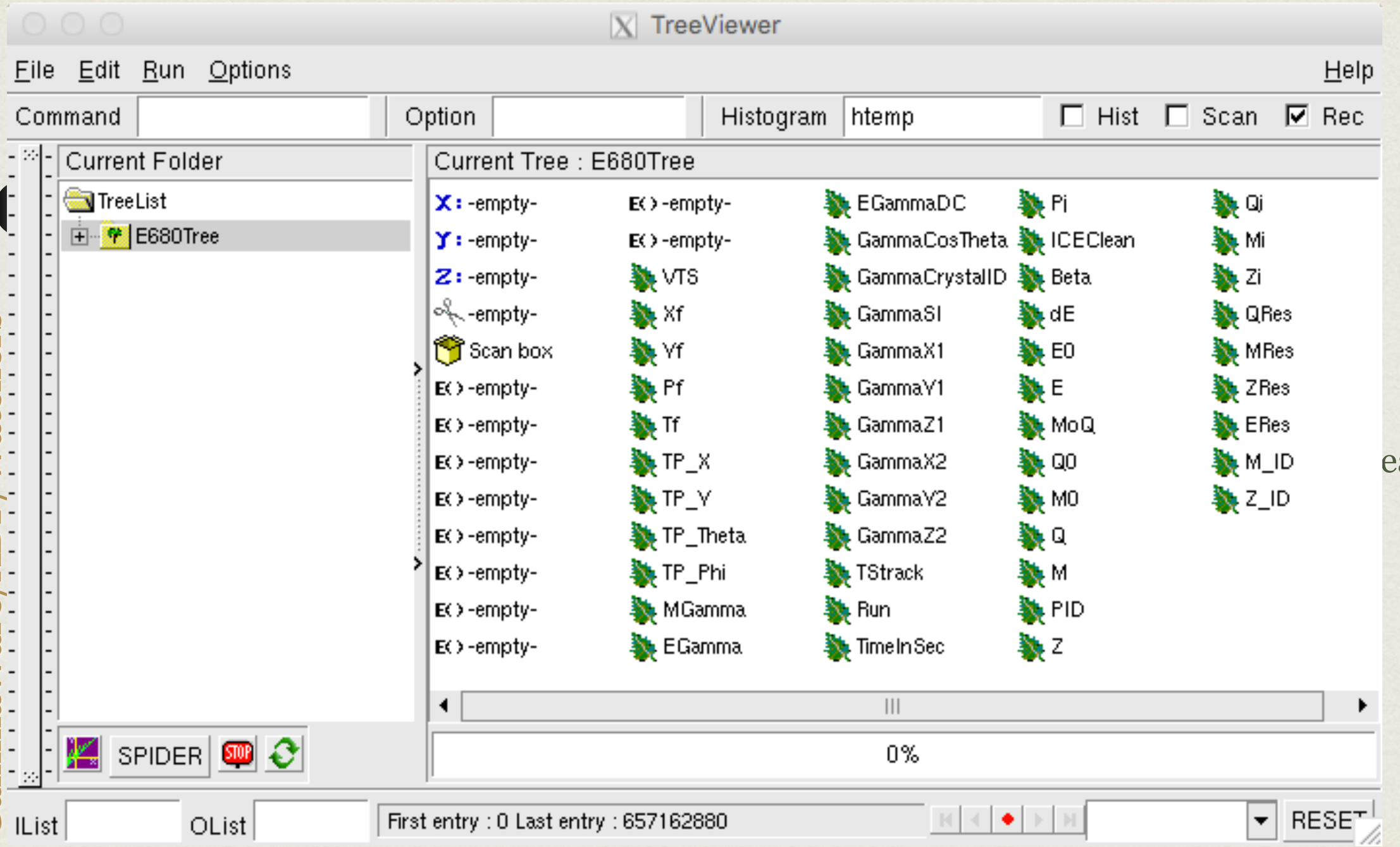
Another step to have coincidences between all processed data

SOME GENERAL REMARKS

Another step to have coincidences between all processed data



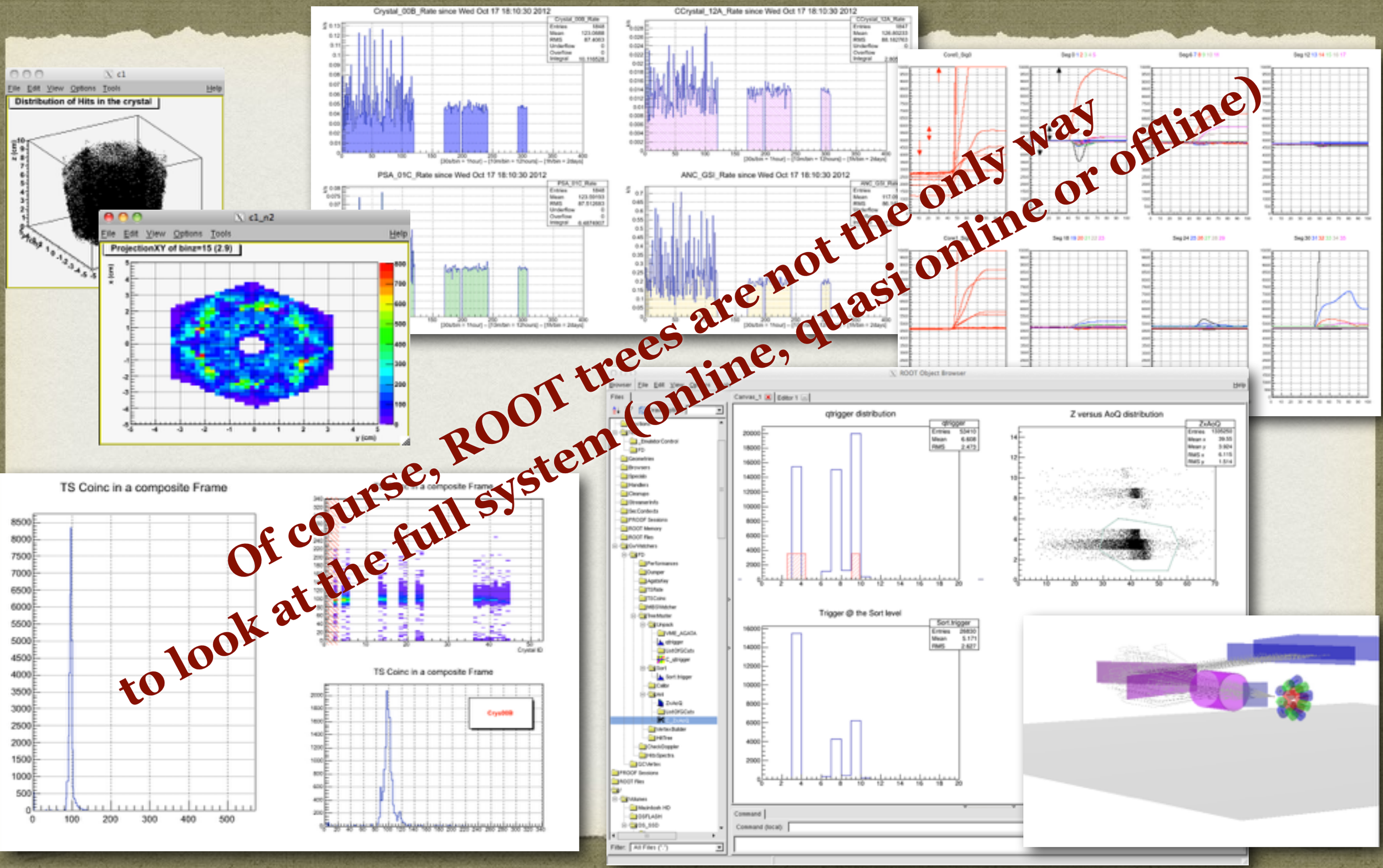
SOME GENERAL REMARKS



GammaWare/ADF/Watchers

eam

SOME GENERAL REMARKS



SOME GENERAL REMARKS

Same approach since the Legnaro Phase

Well adapted for the different campaigns … evolutive enough

- ➥ First GANIL papers in ‘very’ short time
- ➥ Good synergy with VAMOS team

efficient ?

It remains <u>a very complex system</u> :

We do need to keep on working on tools (ex GUI CUBIX*)

We do need to keep on working on methods, algorithms
(neutron damages, PSA, tracking)

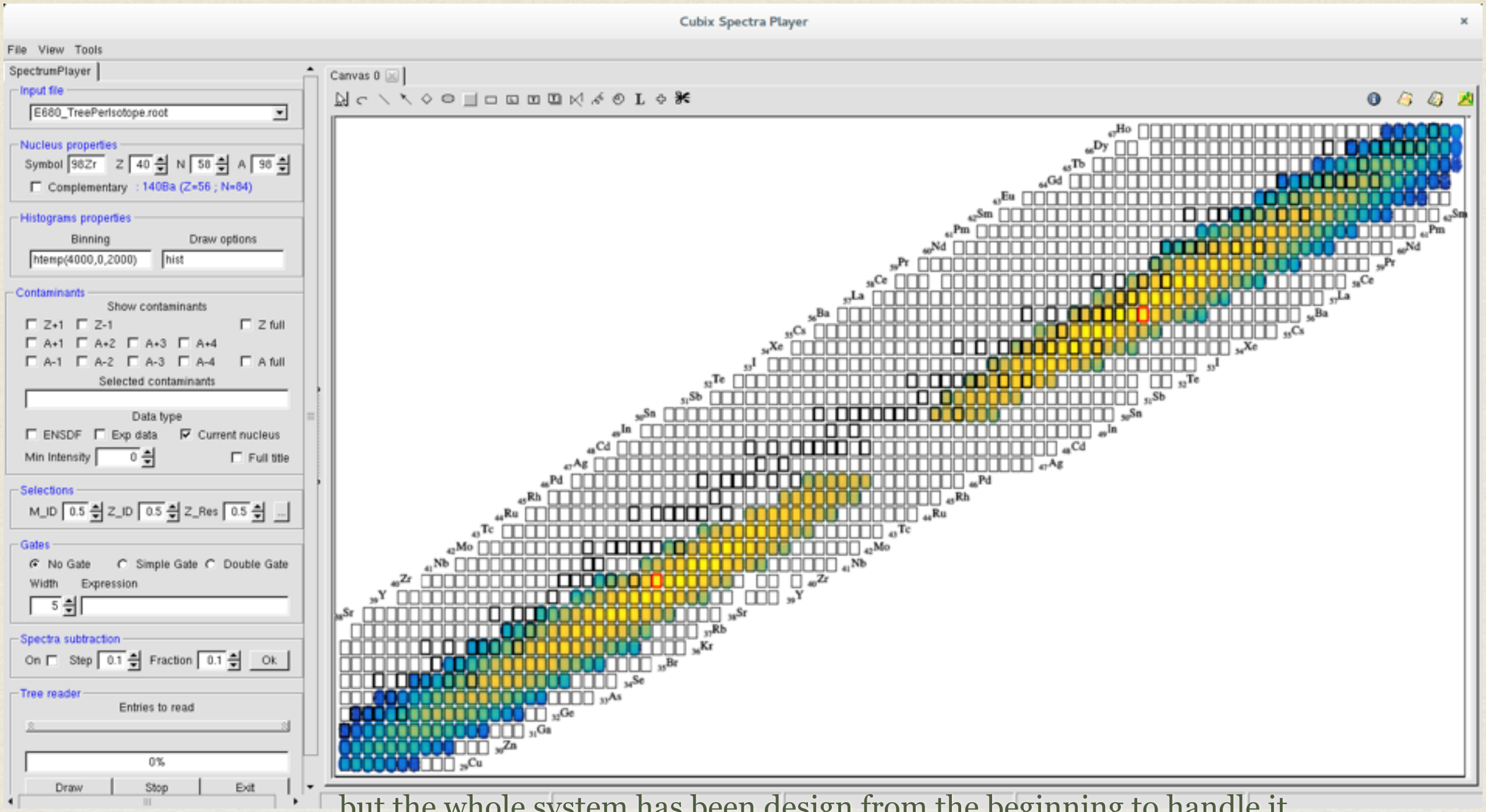
We do need more documentation, exchanges

The Good News : it becomes even more complex !!!

but the whole system has been design from the beginning to handle it

* G. Maquart, J. Dudouet - IPNL, see previous AGATA Week

SOME GENERAL REMARKS



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SOME GENERAL REMARKS

More Documentation :

- Cookbook to install the different software
- Manual For Starting Up AGATA (By Joa and a bunch of nice people)
- User's guide for data analysis @ Local Level *

  Ongoing process (first version soon, slow down by myself …)

  For the different actors, it gives explanations on

  the purpose, the methods, the parameters (configuration files)

  and then the different available tools

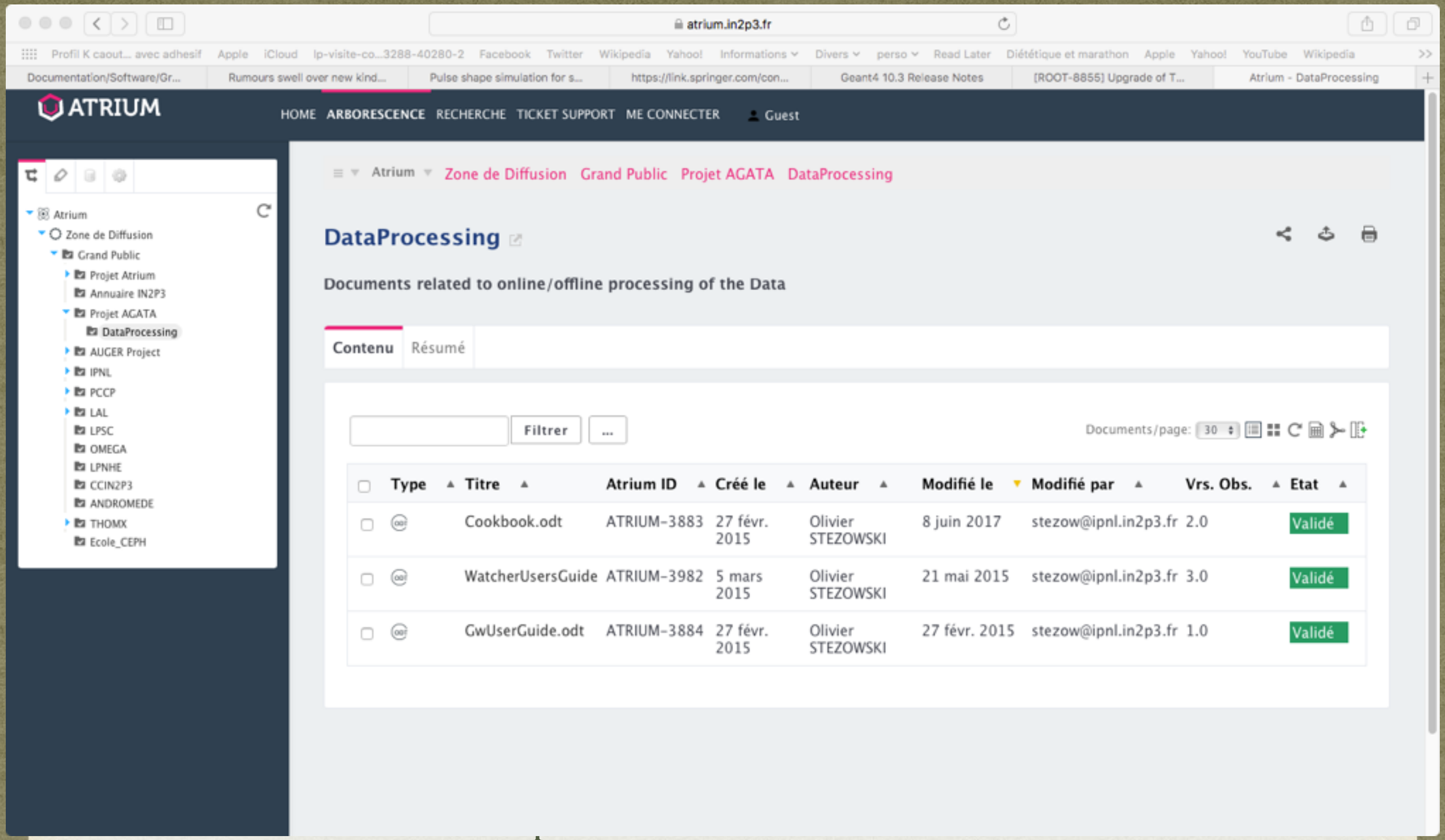
Any Documentation should be :

written as soon as possible

modified regularly

Latest versions are going to be on ATRIUM

* A. Boston, E. Clement, N.Dosmes, J. Dudouet, A. Gadea, L. Hongjie, A. Korichi, N. Lalovic, E. Legay, J.Ljungvall, R. Perez and O. Stezowski



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The Preprocessing actor

This actor is in charge to prepare the data for the PSA algorithm. In order to do that job, the two files which are named **PreprocessingFilter.conf** and **PreprocessingFilterPSA.conf** should contain the required information.

As any detector, any AGATA capsule should be calibrated in energy. Since it is also highly electrically segmented, cross talks have a significant importance and must be corrected. See for instance these publications for such effects:

B.Bruyneel et al., NIMA 608 (2009) / +

As well, there might be time delays between the different segments and the core signal. Any PSA code should gain having all the signals from on capsule perfectly aligned and thus time alignment are also performed.

Here are snapshots of the two required configuration files.

For the first one:

```
ActualClass          PreprocessingFilterPSA
SaveDataDir          /agatadisks/eagata/158er_commissioning/Replay/run_1000/Out/00A
EnergyGain           2
XtalkFile            xinv_1325-1340.cal
WriteTraces          100
```

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```
Actua
SaveD
Energ
Xtalk
Write
```

Energy calibration

Explanations and goals

In digitizers, the signal are processed to extract the amplitude using a trapezoidal filter. This value is written from the beginning of the chain into the data flow. This is the value which is used to calibrate the detectors in energy. Concerning the 36 segments, because of the various cross talks, the calibration in energy is done using events in which only one and only one segment in a given crystal has been fired.

The obtained calibration coefficients are to be set in the 5th of the *PreprocessingFilterPSA.conf* file.

Tools available

** TkT and command line programs **

To use those tools, spectra directly produced by the actors at running time are required. In particular the ones contained in this library[4]:

```
Data/{crystalID}/Prod__4-38-32768-UI__Ampli.spec
```

From the spectra, a C program, called *RecalEnergy*[5], is able to find peaks and thus calibrate the different channels (core and segments) for one crystal. Here is the way to use it, with some options[6]:

The Preprocessing actor

This

files

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B.B

As

code

are

Here

For

```
Act
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```

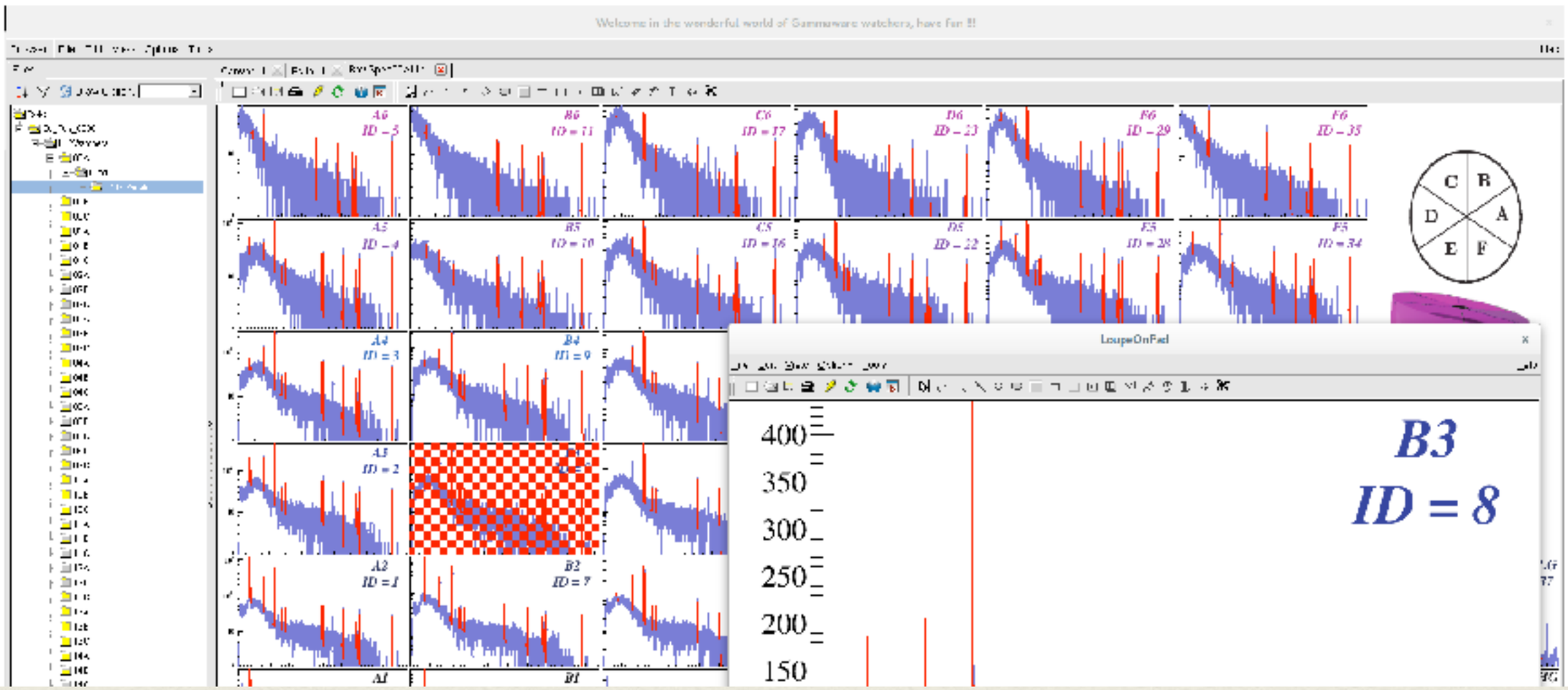
The keyboard shortcut “s+s” can also be used (for Set Source)

If a keyboard shortcut seems not working, check that the canvas, or the pad on which the action must be done has been selected (by a wheel click) !

To fit the whole crystal map with the default parameters, use:

```
GWRecal/Calibrate/FitAll (“Ctrl+f” shortcut)
```

The `SetLoupe` method can here be useful to carefully check the fit result on the different segments (see previous page):



OUTLINE

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THE NEDA / DIAMANT CAMPAIGN

Why this campaign is different from the previous one ?

Ancillaries both based on some NUMEXO2 running ‘independently’
(connected though GTS tree)

NEDA requires Traces for ‘complex’ PSA !
It looks like AGATA **BUT** with up to ~ 100 modules

Each NUMEXO2, 16 channels, is connected to a computer unit (PCI)
NEDA: 96 detectors = 6*16

Topology using as much as possible existing bricks.
What are the ingredients ?

THE NEDA / DIAMANT CAMPAIGN

NUMEXO2

NUMEXO2

.. x 6 + 1 ..

NUMEXO2

with traces

without traces

MFM Frame

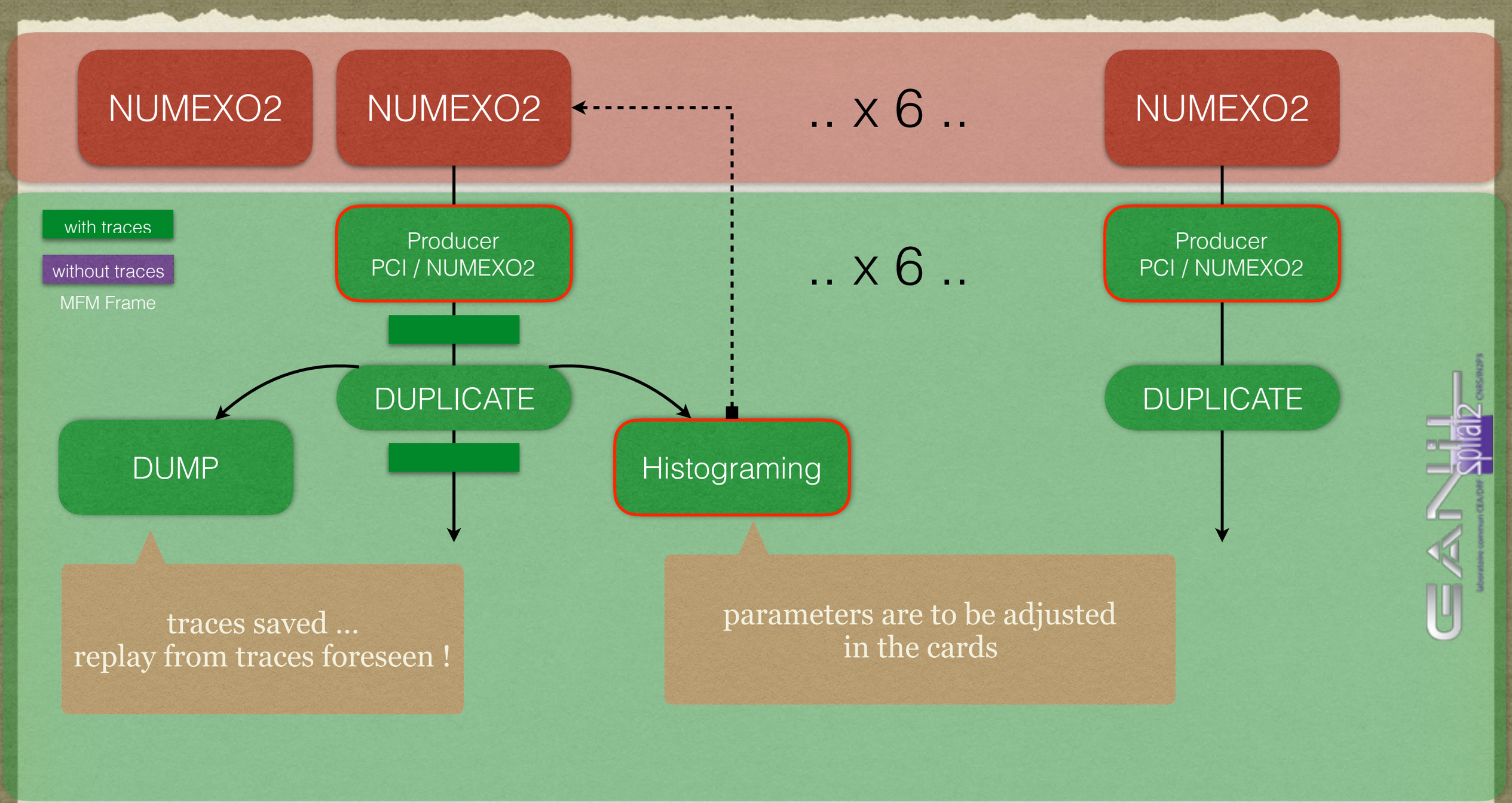
Producer
PCI / NUMEXO2

.. x 6 + 1 ..

Producer
PCI / NUMEXO2

Producer to read the card
MFM Frame

THE NEDA / DIAMANT CAMPAIGN



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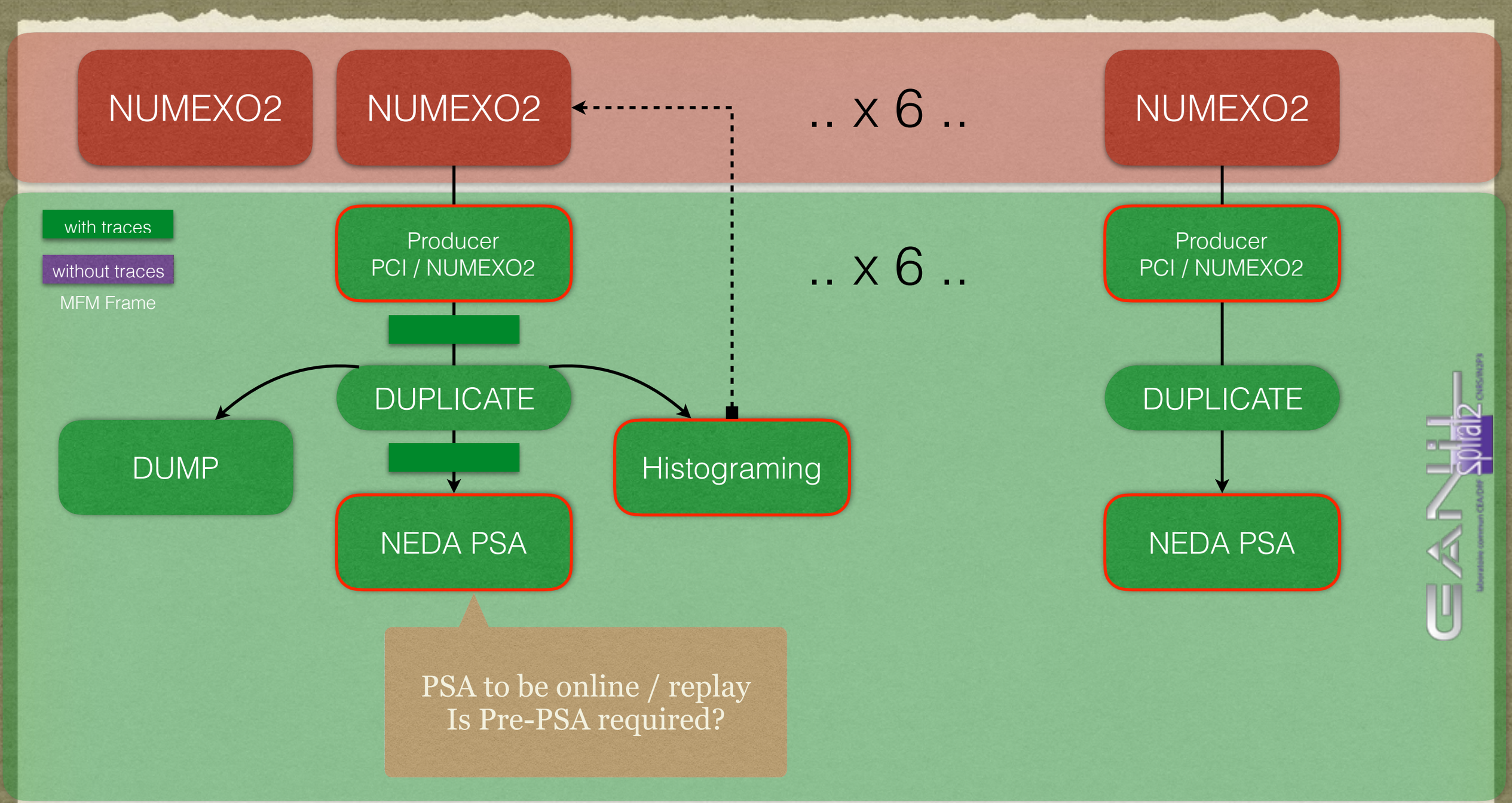

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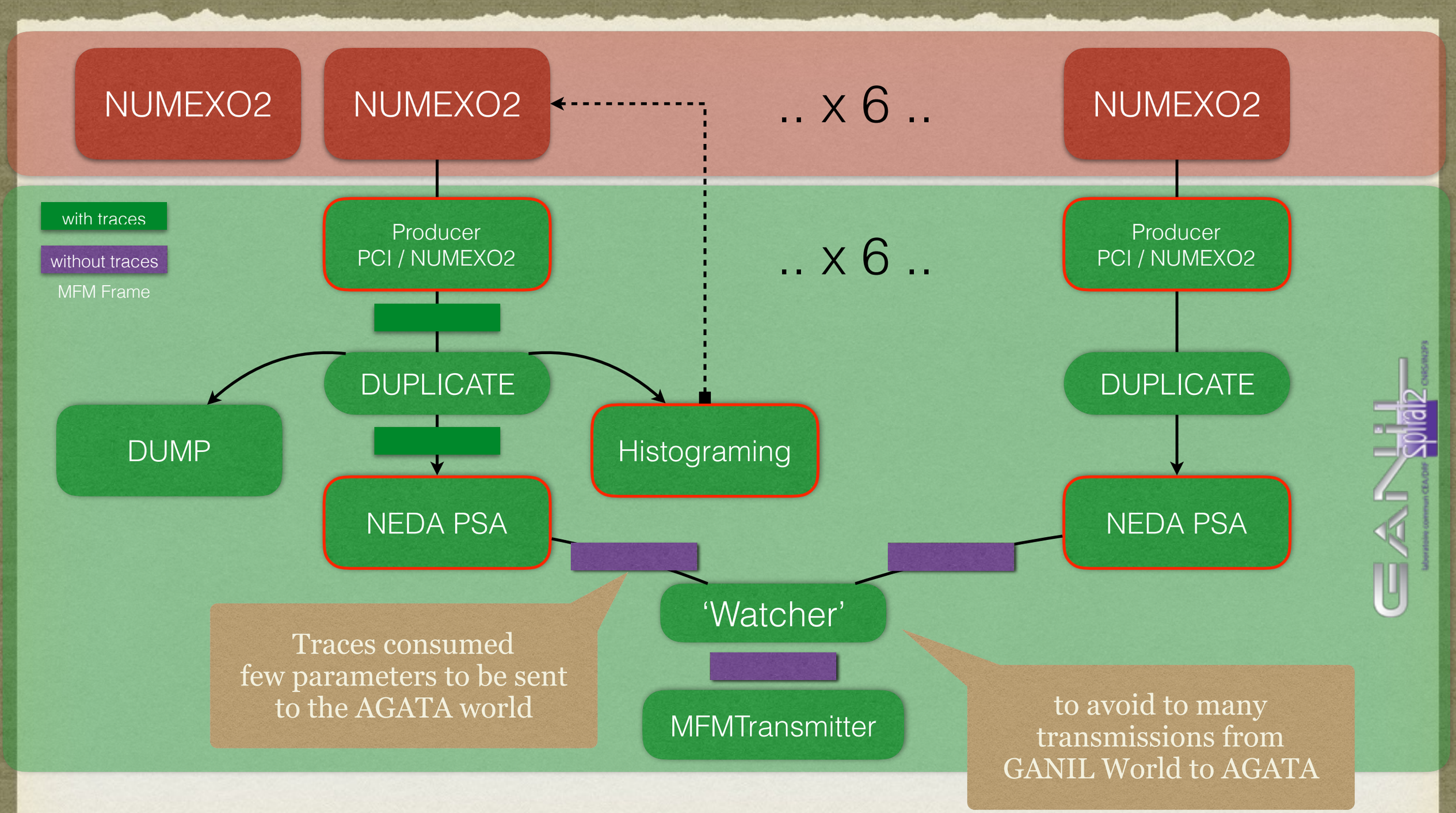

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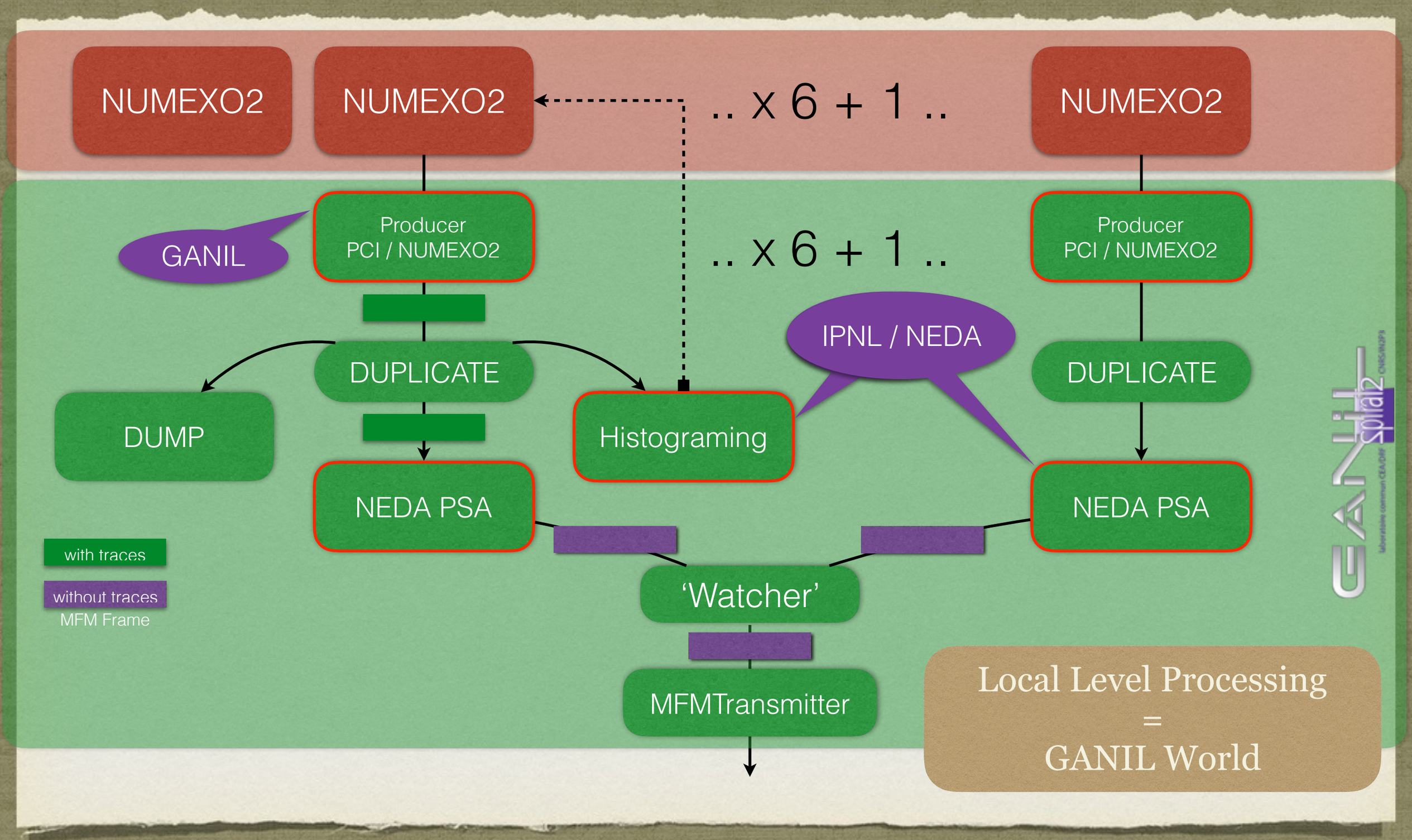

NUMEXO2

NUMEXO2

.. x 6 + 1 ..

NUMEXO2

Producer
PCI / NUMEXO2

.. x 6 + 1 ..

Producer
PCI / NUMEXO2

DUPLICATE

DUMP

Histograming

DUPLICATE

NEDA PSA

NEDA PSA

‘Watcher’

MFMTransmitter

MFMcatcher

Global Level Processing
=
AGATA World

BasicAFC

ADF Frame

MFM2ADF

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.. x 6 + 1 ..

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BasicAFC

Tracking

AGATA
Merger

AGATA EB
[AGATA]

AGATA EB
[DIAMANT]

AGATA EB
[NEDA]

MFMcatcher

MFM2ADF

ADF Frame

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@ some point,before builder,
the data flow should be sorted in TS

BasicAFC

Tracking

AGATA Merger

AGATA EB [AGATA]

AGATA EB [DIAMANT]

AGATA EB [NEDA]

MFMcatcher

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NUMEXO2

1 ..

Producer
PCI / NUMEXO2

DUPLICATE

NEDA PSA

event:data

hits *track* *ancillary*

event:data:psa
n * data:psa

data:tracked

event:data:neda
m * data:neda

‘Watcher’

MFMTransmitter

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BasicAFC

BasicAFC

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THE NEDA / DIAMANT CAMPAIGN

All the C++ actors processing the data flow are / are to be

In the AGAPRO Package
available in a svn server

AGATA EB
[NEDA]

In the GANPRO package
available on a git server*

Histograming

NEDA PSA

There is a python script to help installing them, and various dependencies

python AgataSoftware.py —mfm= all ✔

python AgataSoftware.py —ganpro= all ~✔

* https://gitlab.in2p3.fr/stezow/ganpro

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GRETINA IN AGAPRO

First AGATA-GRETINA tracking arrays collaboration meeting

5-7 décembre 2016
ANL, Physics Division B203
US/Central timezone

Argonne National Laboratory, USA

- Vue d'ensemble
- Programme scientifique
- Detailed Program
- Liste des contributions
- Inscription
- Travel Information
- ANL access/Security
- Accommodations
- Organizing and Advisory committee
- Liste des participants

AGATA
ADVANCED GAMMA TRACKING ARRAY

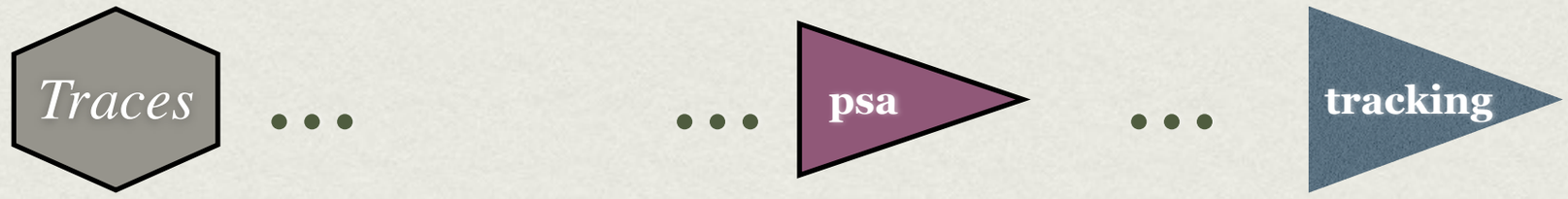
GRETINA

We are pleased to announce the first AGATA-GRETINA collaboration meeting to be held from the 5'th to the 7'th of December 2016 at ANL (Argonne National Laboratory), USA. The meeting will be devoted to discussions about common challenges related to tracking arrays, including the physics, technical details and analysis of data from these arrays. We intend to organize this collaboration meeting on a yearly or bi-yearly basis, alternating between meeting places in the US and the EU. We hope these collaboration meetings will foster collaborations between the AGATA and GRETINA communities and help define and accomplish our common goals.

It could be interesting to process GRETINA data into the AGATA Data Processing chain

GRETINA IN AGAPRO

Same ingredients in GRETINA / AGATA Data Flow



C Structure	Raw GRETINA Data (mode 3)	Decomposed GRETINA Data (mode 2)	Tracked GRETINA Data (mode 1)
Frames (C++ objects)	data:crystal	data:psa	data:tracked

Reading AGATA Data done through a producer BasicAFP

Translation from GRETINA to AGATA requires a Producer
GretinaAFP

GRETINA IN AGAPRO

GretinaAFP is under development (debugged)
to be stressed using first decomposed data (simple) then raw data

The goal is to have a ‘running’ processing for the next workshop
i.e. beginning of April 2018 in order to
take the opportunity of the workshop to start using the tool to
compare the way the data are processed in the two chains

GRETINA IN AGAPRO

GretinaAFP is under development (debugged)
to be stressed using first decomposed data (simple) then raw data

Many difficulties foreseen

- All data corrections (calibration E, Time alignment, x-talk)
- Database of signals for GRETINA capsules to be simulated !

Opportunities foreseen

- GRETINA tracking code running online in AGATA !

CONCLUSIONS

The AGATA Data flow processing / data analysis scheme

- seems flexible enough to handle the different campaigns
- still many tools to be developed to help the user
- Much more documentation required
  we are writing documentation on old tools, should be done as soon as possible!
  Must be always improved by many …

The NEDA/DIAMANT campaign is a new step in complexity

➥ On the same scheme that AGATA an GANPRO package is to be delivered

Developments to process GRETINA Data has just started