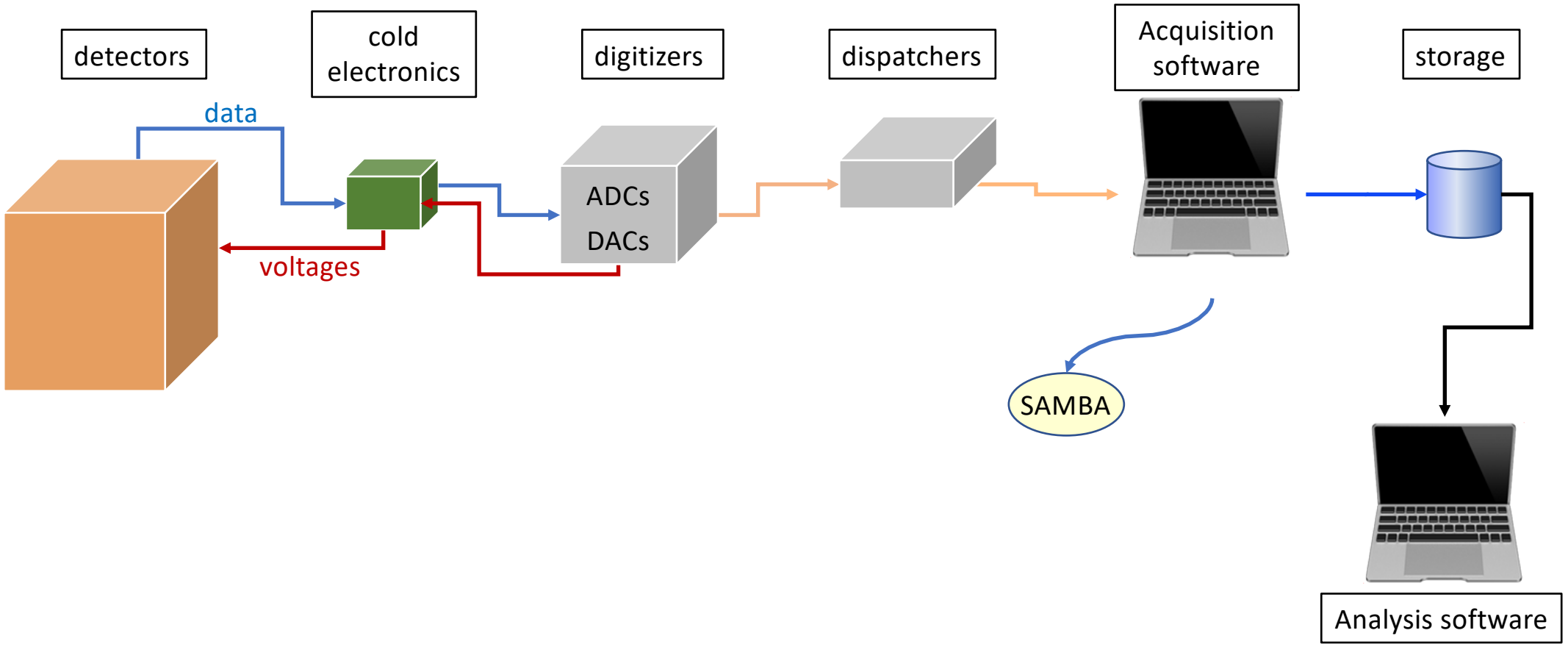
entering inside

SAMBA


detectors
cold electronics
digitizers
dispatchers
Acquisition software
storage
data
voltages
ADCs
DACs
SAMBA
Analysis software

User-defined Data Acquisition Software:

- A nice goal to reach!
- Are we so far?
- Is there some experience which can we benefit from?

SAMBA:
Système d'**A**cquisition **M**ulti-**B**olomètres (sur **A**pple)

- ✓ acquire and store data;
- ✓ select events and analyse;
- ✓ DAQ management, runs management.

TANGO:
Traitement et **A**nalyse **N**ouvelle **G**énération **O**nline

- ✓ event reconstruction (ntuple amplitude, rise time, …);
- ✓ interactive cuts;
- ✓ various interactive plots (histos, fits, biplots,…);

extensive use of the software

- more flexibility for
  - all parameters like number of channels, actual setup, …;
  - data processing;
  - trigger methods.
- more scalability for the electronics part:
  - adapted and controlled structure;
  - simpler and smaller boxes;
  - cheaper setup.

=> more potential for **developments**
=> more potential for **distribution** (test-benches)

- Cumulated knowledge: since 2005;
- Large number of integrated functionnalities,
- Meets the following wide requirements:

Hardware :

- ✓ Multiples detectors (user-defined), of multiples types (user-defined);
- ✓ Multiples channels per detector (user-defined), of multiples types (user-defined);
- ✓ Multiples cabling sketches (user-defined);
- ✓ Multiples ADC + DAC boxes, of multiple type (user-defined);
- ✓ All this setup is defined through external text files, and experiment-independant;
- ✓ Management of the setup through GUI or by editing these text files;
- ✓ 5 dispatching systems type supported; IP systems to be « generic »;
- ✓ synchronisation of the computers, if several are needed.

Detector Preparation :

- Individual or for a selection;
- Definitions through GUI or by editing user-defined text files:
  - processings,
  - triggering,
  - disk writing;
- Automatic sequences from user-defined scripts.

Adjusting :

- Power spectrum for the electronique noise (for origin identification);
- Mode « oscilloscope »;
- Individual operation and control, for each élément (detector, digitizer, data dispatching).

Data taking :

- The whole data are available (stream mode);
- Library of various ready-to-use algorithms :
  - processings :
    - filtering (butterworth, chebyshev, elliptic),
    - smoothing,
    - event template convolution (analytic or tabulated),
    - demodulation,
    - mean value,
    - maximum by intervals;
  - triggering:
    - threshold,
    - amplitude+rise time,
    - derivative,
    - duration,
    - Random;
- Data storage: stream and/or by event
- *Processing, events and storage are user-defined per channel*

- Example of a supplementary functionality: the *pseudo channels*
  - additional software channels may be defined after the hardware ones;
  - a 'pseudo channel' may be any linear combination of the previously defined channels (from the same detector);
  - this pseudo channel may receive any parameter just like the hardware ones: processing, event definition, trigger logic,…
  - application #1: a copy of a channel allows to process/save the signal in 2 formats:

    pseudo fastA = ionisA
  - application #2: the trigger logic is applied to a combination of the 2 similar channels:

    pseudo sHeat = "0.7 x heatA + 0.3 x heatB"
  - *user interface to be defined*.

- Example of a supplementary feature: the *random* trigger
  - Free parameters:
    - Event rate;
    - Delay fluctuation.
  - Defined on a channel basis;
  - Replaces any other trigger logic for this channel.

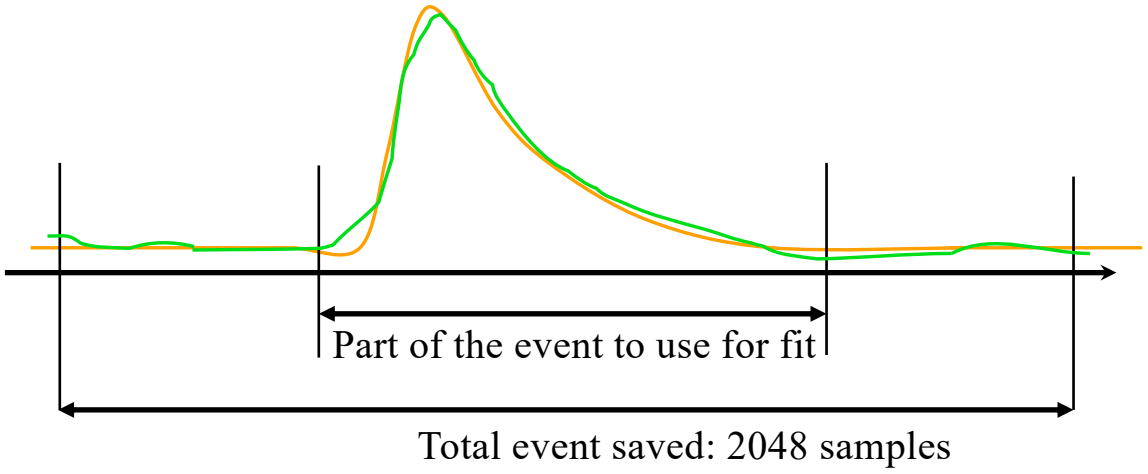
- User scripts
  - User-defined functions called at various times of the experiment life.

- Example of a supplementary algorithm: the trigger logic

Improvement 1: automatically compute the appropriate threshold after the current noise ("**adaptative trigger**").

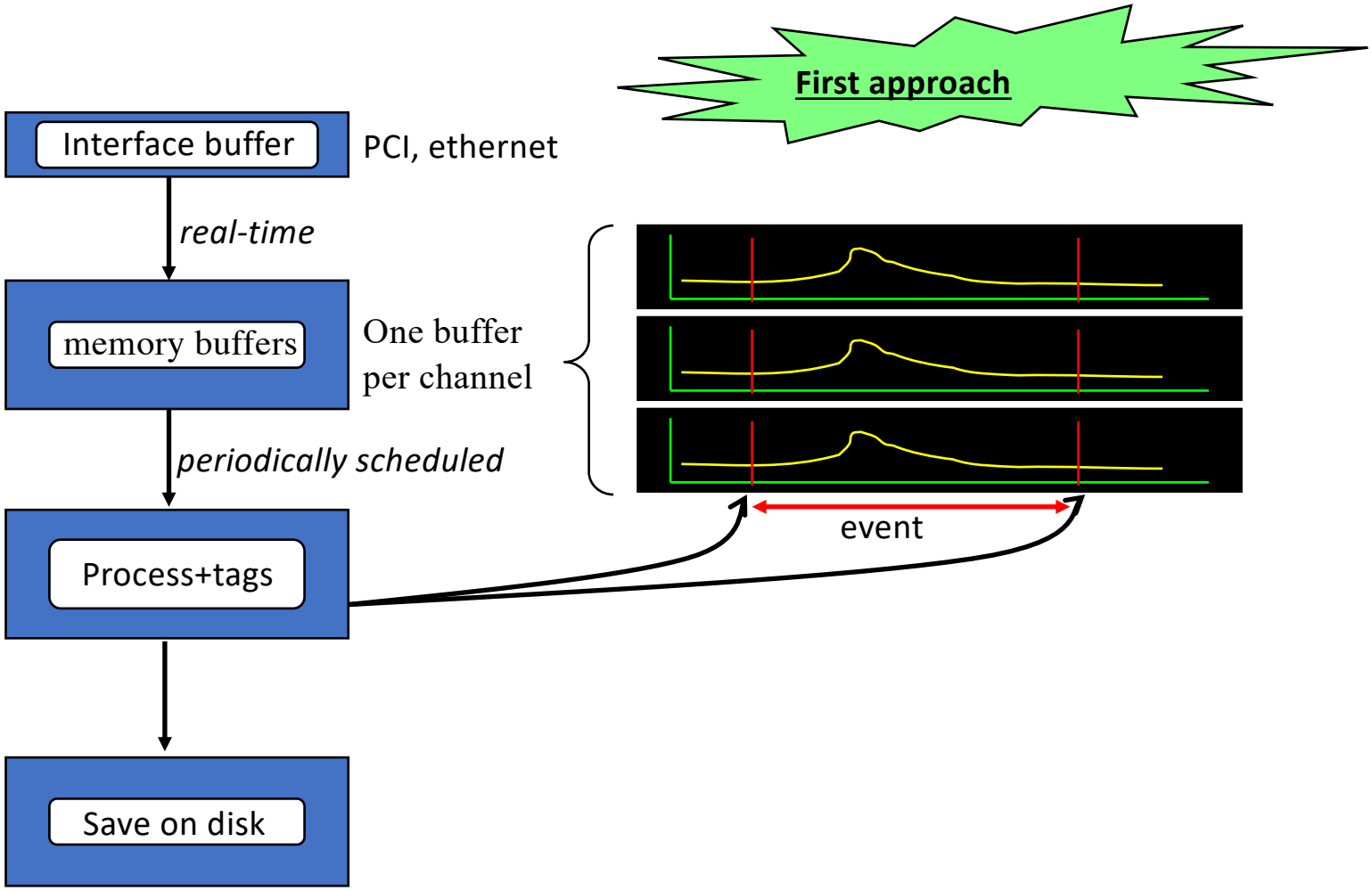
Problem: at low level, threshold oscillate (data are integer), and final analysis threshold are higher than could be expected from acquisition noise.

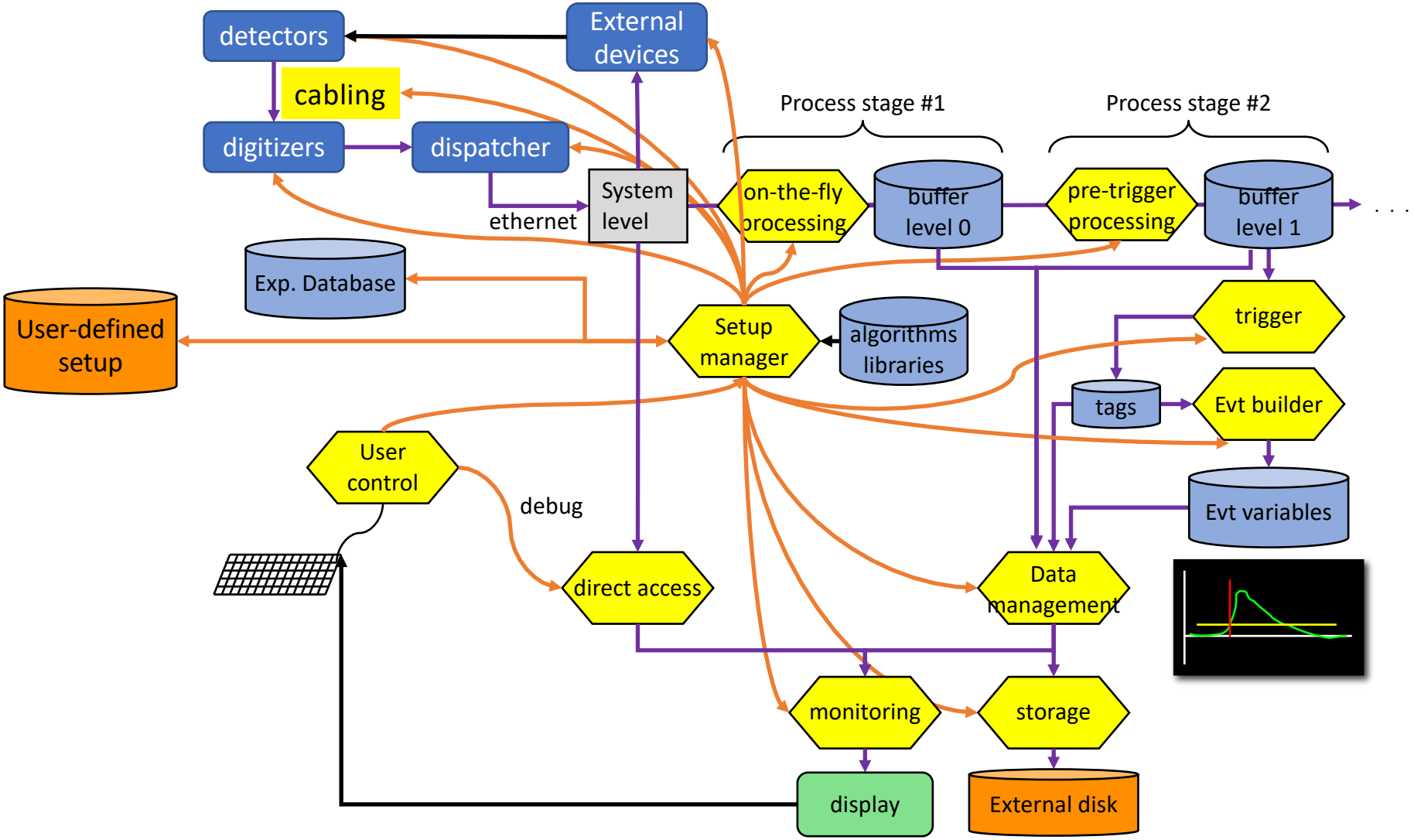
Improvement 2: direct fit with a pulse shape (analytic or tabulated) = sliding **template convolution**.

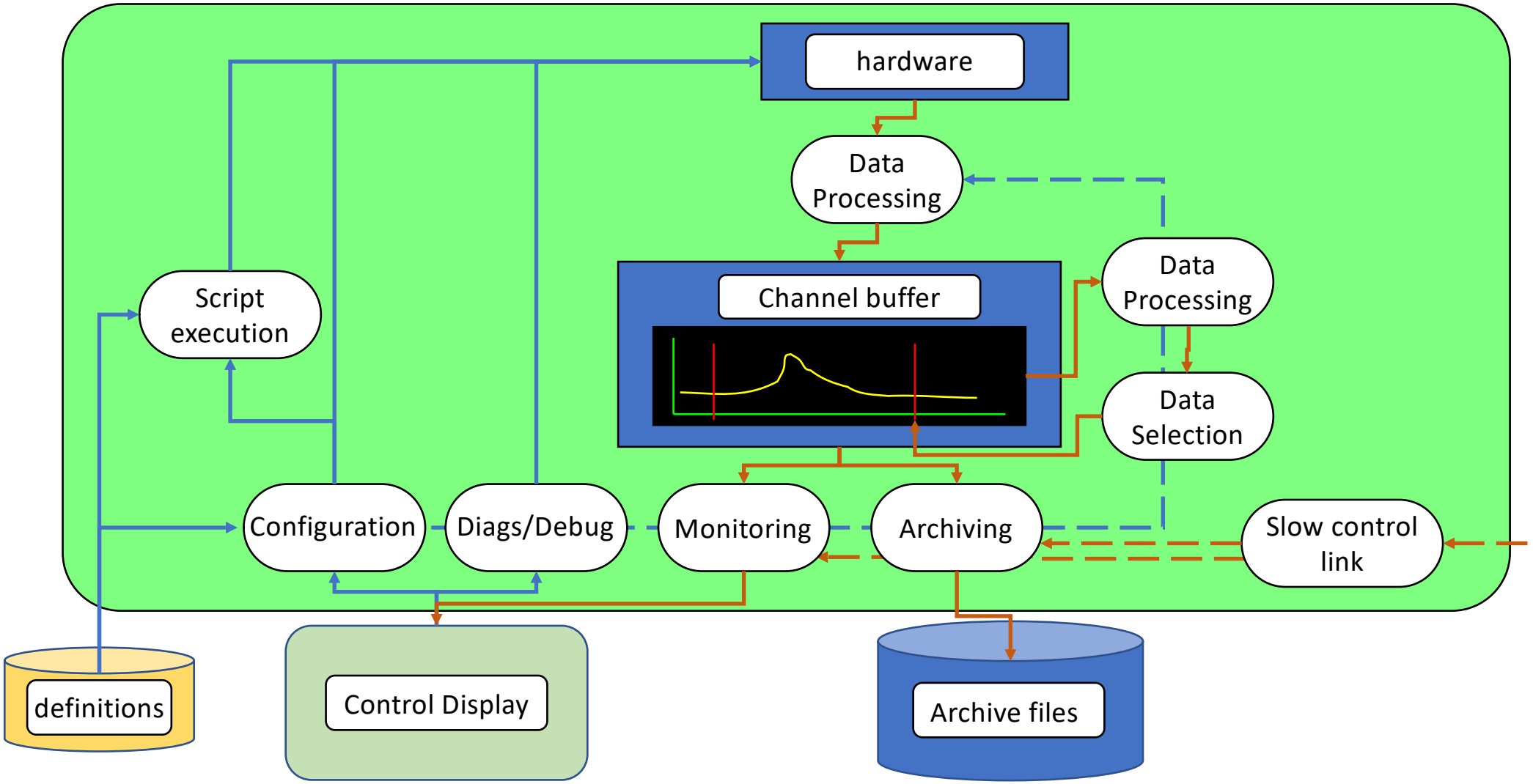


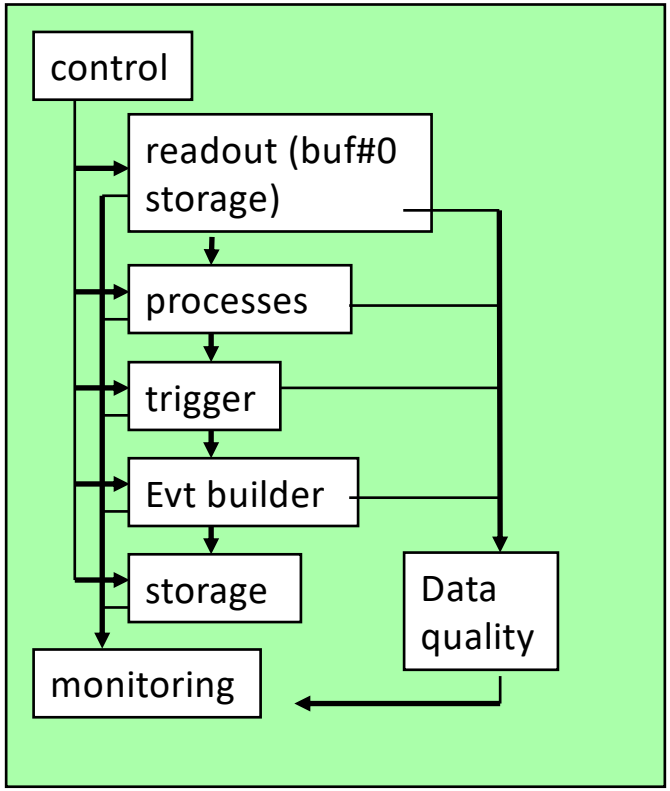
- User definition with either *text files* or *graphic user interface* for
  - all the hardware (detectors, digitizers, dispatchers, cabling),
  - all processing parameters (event definition, data processes, triggering, data storage),
  - ➢ live plots;
- Wide-range complex built-in procedures;
  - Activating the electronics,
  - Noise power Spectra;
- User scripts (in text files) to set up the electronics, or for periodic procedures (loops, waits, ...);
- Dashboards for electronics surveillance;
- Low-level connexions for hardware diagnostics and debugging;
- Algorithms library (processings, trigger);
- Ntuple storage on a text file (with the first line as a header);
- Mode "oscilloscope" with threshold trigger and amplitude histogram;
- Calendar for data taking;
- Plots saving with improved quality, in JPEG format.

➢ Samba is spread to experiments as different as EDELWEISS, CUPID-MO, NEWS-G, R2D2.

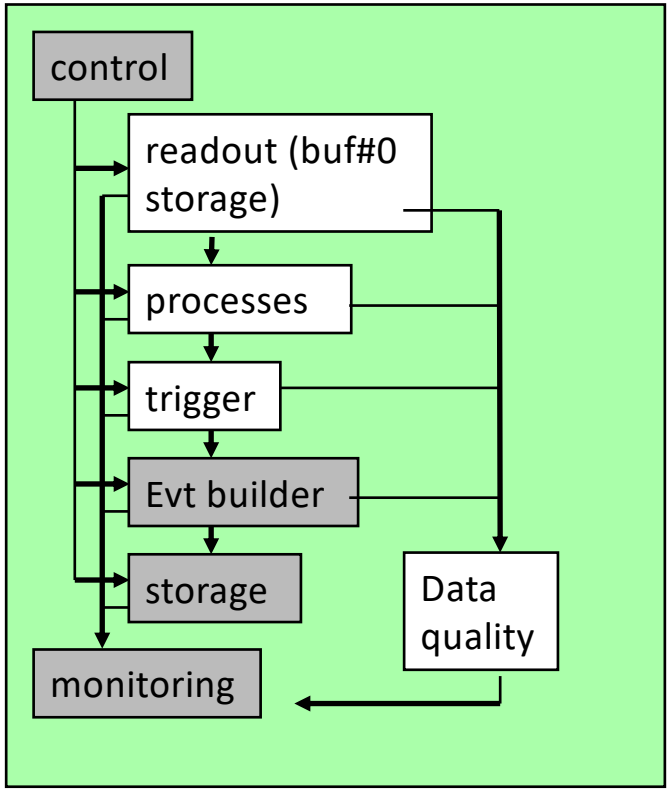

First approach
Interface buffer
PCI, ethernet
real-time
memory buffers
One buffer
per channel
periodically scheduled
Process+tags
event
Save on disk


detectors
External devices
cabling
digitizers
dispatcher
ethernet
System level
Process stage #1
Process stage #2
on-the-fly processing
buffer level 0
pre-trigger processing
buffer level 1
. . .
Exp. Database
User-defined setup
Setup manager
algorithms libraries
trigger
tags
Evt builder
User control
debug
Evt variables
direct access
Data management
monitoring
storage
display
External disk

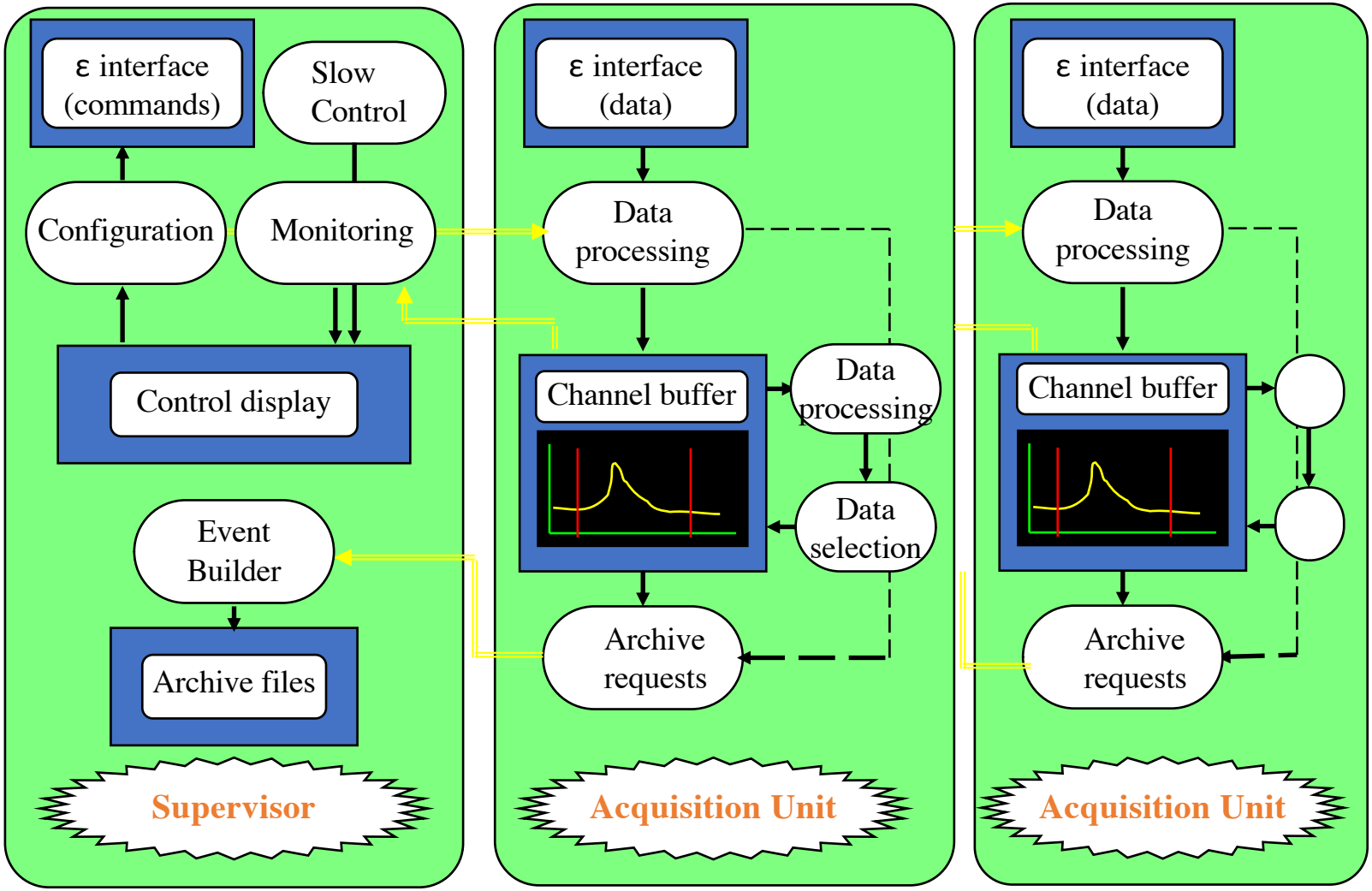

hardware
Data Processing
Channel buffer
Data Processing
Script execution
Data Selection
Configuration
Diags/Debug
Monitoring
Archiving
Slow control link
definitions
Control Display
Archive files

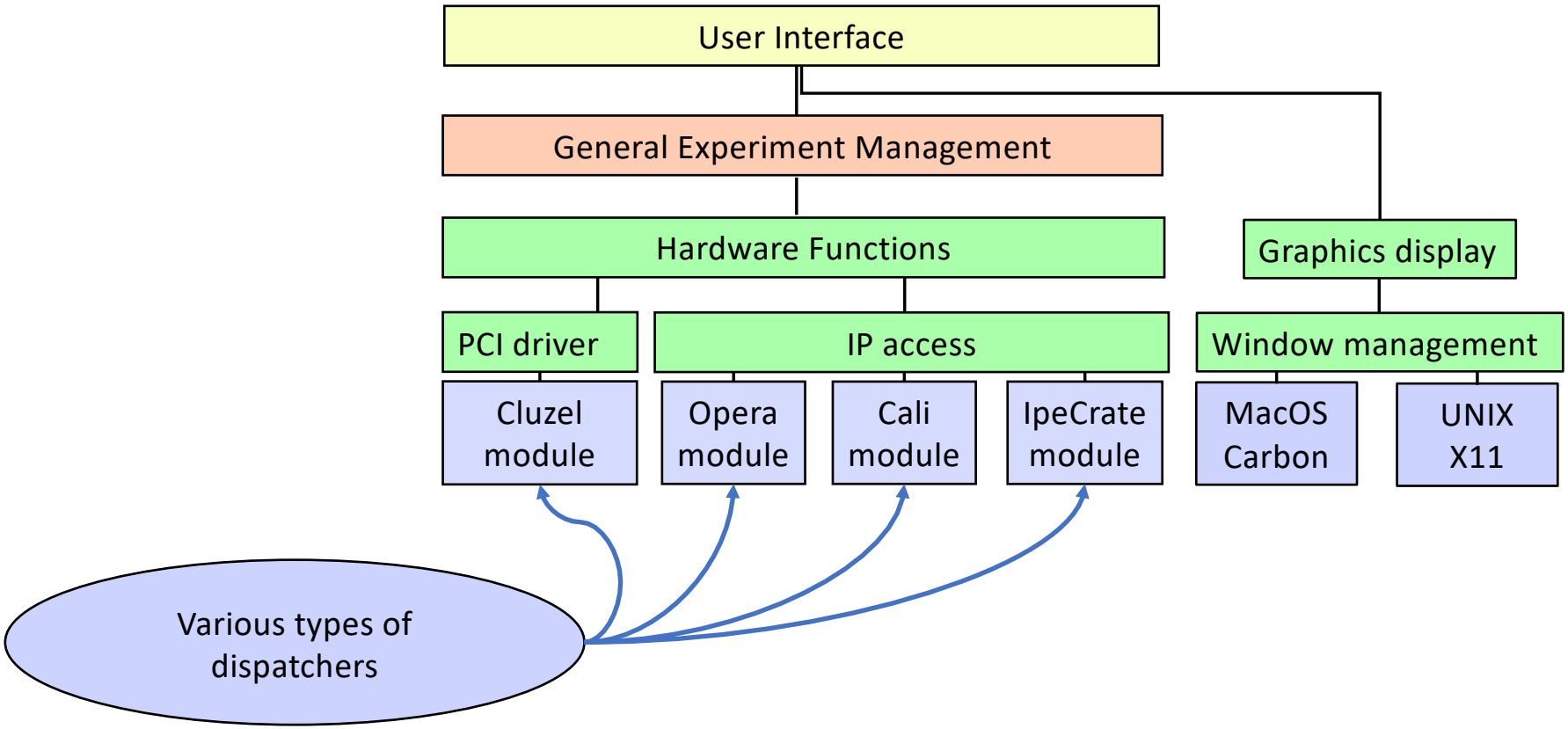


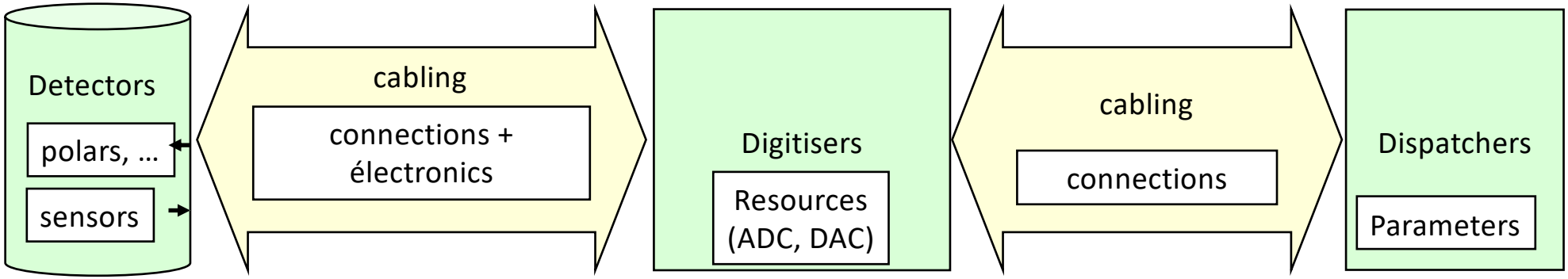
Standalone mode



« node » (slave mode)
master


ε interface (commands)
Slow Control
Configuration
Monitoring
Control display
Event Builder
Archive files
Supervisor
ε interface (data)
Data processing
Channel buffer
Data processing
Data selection
Archive requests
Acquisition Unit
ε interface (data)
Data processing
Channel buffer
Archive requests
Acquisition Unit


User Interface
General Experiment Management
Hardware Functions
Graphics display
PCI driver
IP access
Window management
Cluzel module
Opera module
Cali module
IpeCrate module
MacOS Carbon
UNIX X11
Various types of dispatchers

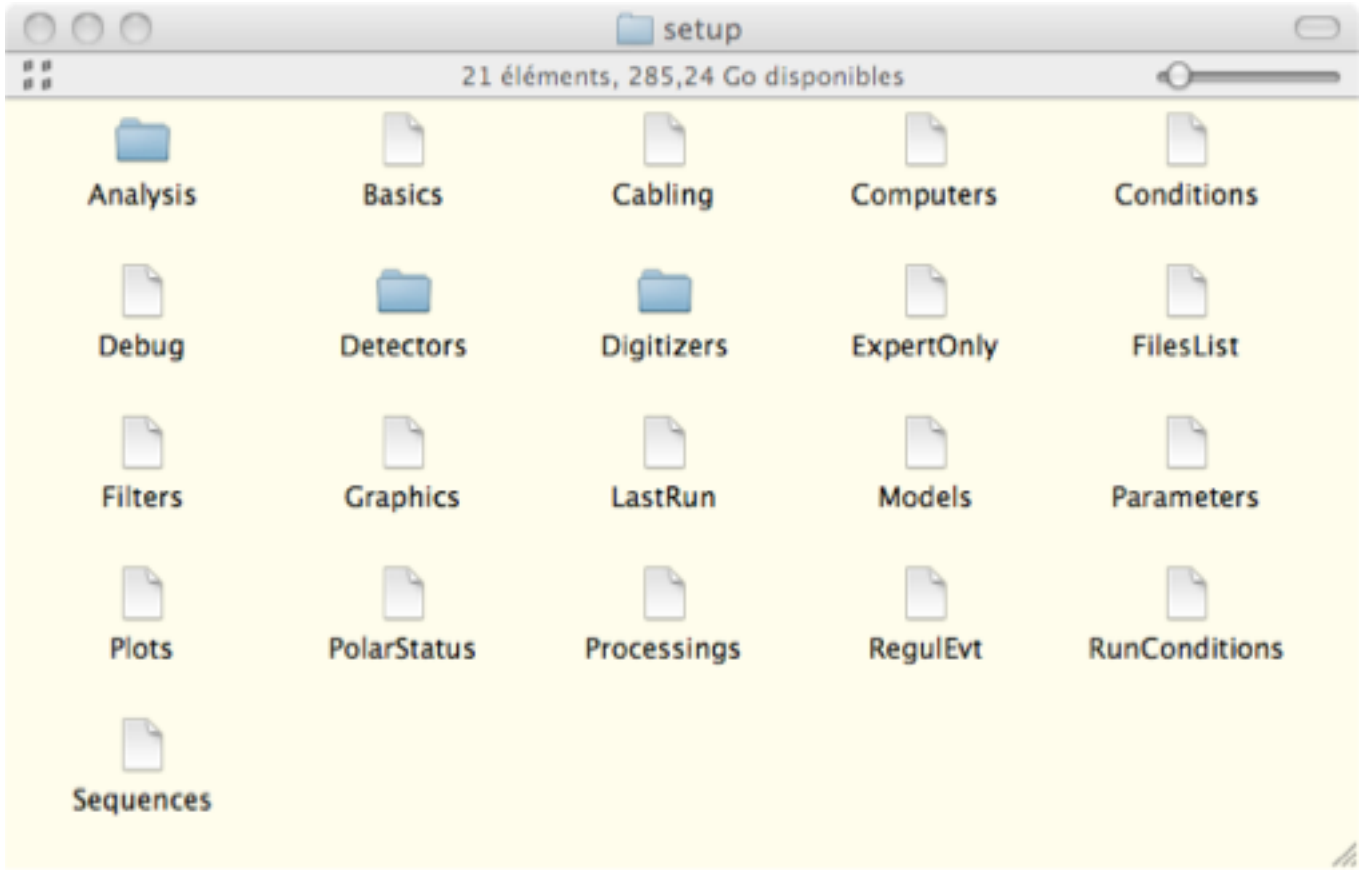


- hardware which are defined by a same list of parameters and channels are said to be of same type
  - *all LMO detectors have the same list; all BBv2 as well*

- establishing a list of variables for a given type turns to define a model
  - models of detectors: *ID, FID, LMO*; digitizers: *BBv1, BBv3*; cabling: *LMO-BB1BB3*; dispatchers

- managing external information is part of the User Interface.
  - *the User Interface Library has been improved to handle complex structured data*

- all models of **detectors**, of **digitisers**, and ways of **cabling** them, are **user defined**
  - !! *every family of dispatcher need a specific support (pre-defined library)*


setup
21 éléments, 285,24 Go disponibles
Analysis
Basics
Cabling
Computers
Conditions
Debug
Detectors
Digitizers
ExpertOnly
FilesList
Filters
Graphics
LastRun
Models
Parameters
Plots
PolarStatus
Processings
RegulEvt
RunConditions
Sequences

```
Detector FullSphere = {
        sensors = ( ball, umbrella, light )
        settings = (
                { HVb := sensor = ball, category = polar},
                { HVu := sensor = umbrella, category = polar }
        )
}

Digitizer CaliADC = {
        resources = (
        { DAC1 := category = polar, address = 0x04, masque = 0xFFF,
                unit = Volts, encode = float,
                float.min = 0.0, float.max = 8000.0 },
        { DAC2 := category = polar, address = 0x08, masque = 0xFFF,
                unit = Volts, encode = float,
                float.min = 0.0, float.max = 8000.0 }
        )
}

Cabling = (
        { full_std := detector = FullSphere, digitizers = ( CaliADC ),
                sensors = ( { ball := 1.1 }, { umbrella := 1.2 } ),
                settings = ( { HVb := DAC1 }, { HVu := DAC2 } )
}
```

blue: your own
green: user value
! from your previous defs
black: Samba lexics
orange: user values
! *from Samba keywords*

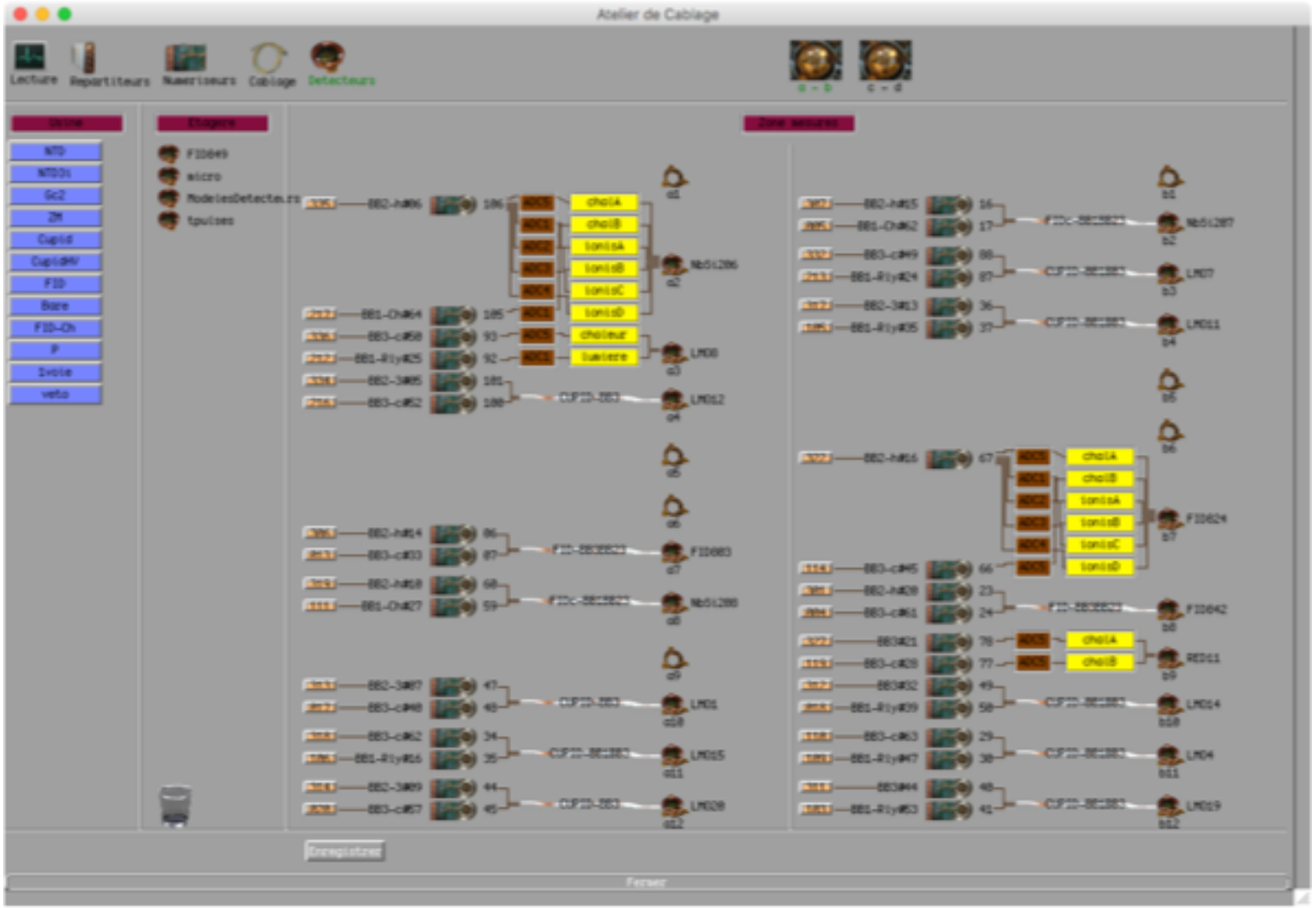
```
{ CupidHV := sensors = ( chaleur, lumiere ), settings = (
        { ampl-chaleur := categorie = modulation, sensor = chaleur },
        { comp-chaleur := categorie = compensation, sensor = chaleur },
        { corr-chaleur := categorie = correction, sensor = chaleur },
        { gain-chaleur := categorie = gain, sensor = chaleur },
        { polP := categorie = polar, sensor = chaleur },
        { d2C := categorie = d2, sensor = chaleur },
        { d3C := categorie = d3, sensor = chaleur },
        { raz-chaleur := categorie = razfet, sensor = chaleur },
        { polM := categorie = polar, sensor = chaleur },
        { ampl-lumiere := categorie = modulation, sensor = lumiere },
        { comp-lumiere := categorie = compensation, sensor = lumiere },
        { corr-lumiere := categorie = correction, sensor = lumiere },
        { gain-lumiere := categorie = gain, sensor = lumiere },
        { d2L := categorie = d2, sensor = lumiere },
        { d3L := categorie = d3, sensor = lumiere },
        { raz-lumiere := categorie = razfet, sensor = lumiere },
        { rPol := categorie = relais, sensor = lumiere },
        { rFB := categorie = relais, sensor = lumiere }
), regeneration = non },

{ 1voie := sensors = ( signal ), settings = () },
{ veto := sensors = ( hits, stampHi, stampMi, stampLo ), settings = () }
```

blue: your own
green: user value
! from your previous defs
black: Samba lexics
orange: user values
! *from Samba keywords*

```
LMO1 := modele = CupidHV, status = ok # (HS/ok)
    reglages chaleur = {
        ampl-chaleur = 2.000
        comp-chaleur = 0.000
        corr-chaleur = 99.804
        gain-chaleur = 2
        d2C = 200
        d3C = 500
        raz-chaleur = libre
    }
    evenement chaleur = {
        duree = 2048            # Duree evenement (millisec.)
        delai = 0               # Decalage evenement (millisec.)
        interv = 10             # Fenetre de recherche (millisec.)
        pre-trigger = 50        # Pre-trigger (%)
        temps-mort = -1         # Temps mort avant nouvelle recherche (milllisec.)
    }
    trigger chaleur = {
        type = seuil            # Type de recherche d'evenement (neant/seuil/front/porte/bruit)
        signe = positif         # Sens de la variation attendue (negatif/indifferent/positif)
        regulation = non        # Autorisation de reguler automatiquement
        amplitude.min = 100     # Amplitude minimum pour impulsions positives (ADU)
        amplitude.max = -10     # Amplitude maximum pour impulsions negatives (ADU)
    }
```

blue: your own
green: user value
! from your previous defs
black: Samba lexics
orange: user values
! *from Samba keywords*

Graphic interface for the setup definition



Graphic interface for the setup definition

```
+ high amplitude sensor signal /form=signal /duration=20/limits=500 1000
                               /dimensions=334 240/position=783 607/display=yes/grid=no /data=
      sensor s50b raw          (0000 FFFF 0000)
      laser  s50b raw          (7FFD 7FFD 0000)

+ low amplitude sensor /form=signal /duration=20/limits=-3000 -2000
                       /dimensions=364 244/position=403 609/display=yes/grid=no /data=
      sensor s50b raw          (0000 FFFF 0000)

+ baseline RMS /form=histo /bins=200/evts=0/limits=0 100
                /dimensions=318 296/position=890 45/display=yes/grid=no /data=
      noise  sensor s50b                (0000 FFFF 0000)
+ high amplitudes /form=histo /bins=200/evts=0/limits=0 40000
                  /dimensions=200 200/position=599 360/display=yes/grid=no /data=
      amplitude sensor s50b      (0000 FFFF 0000)

+ Laser trigger /form=signal /duration=2/limits=45 85
                 /dimensions=368 205/position=1028 365/display=yes/grid=no /data=
      laser s50b raw           (0000 FFFF 0000)

+ frequency spectrum /form=fft /freq-min=0.1/freq-max=100/echantillons=1024/axeX=log
                /limits=0.1 100/dimensions=299 292/position=882 44/grid=yes /data=
      sensor s50b raw          (0000 0000 BFFE)
```

```
Variables = (
        { Type := mot-cle, liste = labo/calibration/fond/debug, description = "Type du run" },
        { HV1 := int, description = "Tension capteur HV1 (V)" },
        { HV2 := int, description = "Tension correcteur de champ HV2 (V)" },
        { Pression_mb := float, description = "Pression totale (mb) " },
        { Gaz := mot-cle, liste = He/Ne/Ar/Xe/N2, description = "Gaz principal " },
        { Quencher := mot-cle, liste = CH4, description = "Moderateur " },
        { Taux := float, description = "Quantite relative de moderateur (%)" },
        { Source := mot-cle, liste = neant/ar37/fe55, description = "Source de calibration en place" },
        { Blindage := mot-cle, liste = "absent/ouvert/ferme", description = "Configuration du blindage" }
)
```

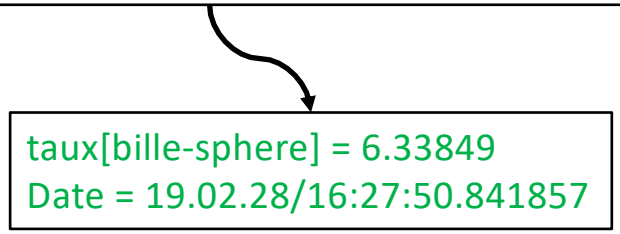
reported with the run data

```
Type = labo             # Type du run
HV1 = 0                 # Tension capteur HV1 (V)
HV2 = 0                 # Tension correcteur de champ HV2 (V)
Pression_mb = 0         # Pression totale (mb)
Gaz = He                # Gaz principal
Quencher = CH4          # Moderateur
Taux = 0.7              # Quantite relative de moderateur (%)
Source = neant          # Source de calibration en place
Blindage = absent       # Configuration du blindage
```

red: user value from the slow-control

```
utilise = (
        { Hc1 := "hauteur suspension 1", unite = , archive = no, display = no, format = float, min = 0.0, max = 0.0  },
        { Hc2 := "hauteur suspension 2", unite = , archive = no, display = no, format = float, min = 0.0, max = 0.0  },
        { Hc3 := "hauteur suspension 3", unite = , archive = no, display = no, format = float, min = 0.0, max = 0.0  },
        { Hc4 := "hauteur suspension 4", unite = , archive = no, display = no, format = float, min = 0.0, max = 0.0  },
        { S_i := S_i, unite = , archive = no, display = no, format = float, min = 0, max = 0  },
        { T_Bolo := "T bolo", unite = , archive = no, display = cadrant, format = float, min = 0.0, max = 0.05  },
        { T_Speer := "T speer", unite = , archive = no, display = cadrant, format = float, min = 0.0, max = 0.05  },
        { P_regul := "P regul", unite = , archive = no, display = cadrant, format = float, min = 0.0, max = 10.0  },
        { Ba_grotte := "Calibration grotte", unite = , archive = no, display = voyant, format = bool,   },
        { Ba_nemo := "Calibration Nemo", unite = , archive = no, display = voyant, format = bool,   },
        { Co_France := "Regeneration France", unite = , archive = no, display = voyant, format = bool,   },
        { Co_Italie := "Regeneration Italie", unite = , archive = no, display = voyant, format = bool,   }
)
sources = (
        { Ba_grotte := calib-grotte, role = calib },
        { Ba_nemo := calib-nemo, role = calib },
        { Co_France := regen-france, role = regen },
        { Co_Italie := regen-italie, role = regen }
)
autorisees = no         # Autorisation de deplacer les sources
```

```
Exports = (
        {
                support = fichier          # Support d'envoi (fichier/memoire/udp)
                nom = DernierExport        # Nom du support
                periode_ms = 250           # Intervalle entre exportations (ms)
                #
                # Mesures implementees: impedance/taux_voie/taux_global
                #
                exportable = { taux := taux_voie  }
                exporte = ()
        }
)
```



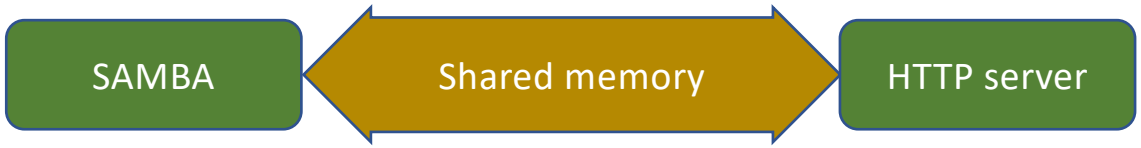
1. **User definitions**:
   - rather JSON than XML;
   - JSON readability has been improved: declarations “a la C” (‘{}’, ‘()’, …);
   - Object-oriented files (one per detector, one per ADC, etc…);
   - Uniform syntax over all files -> solid universal UI to/from setup files for any info.

2. **User-defined algorithms**:
   - Moves the difficulty from the developers to the users;
   - At the same time, the users have not a compiler to prevent interactively errors;
   - Good to keep a library of algorithms and ask only for parameters;
   - In general, *think to let to the user **the less work as possible**, and the **most ways of dialog** as possible*;
   - **Big work** to achieve a user-friendly error and recovery reporting [colouring code];
   - ➢ High speed sampling not so compatible with interpreted languages.

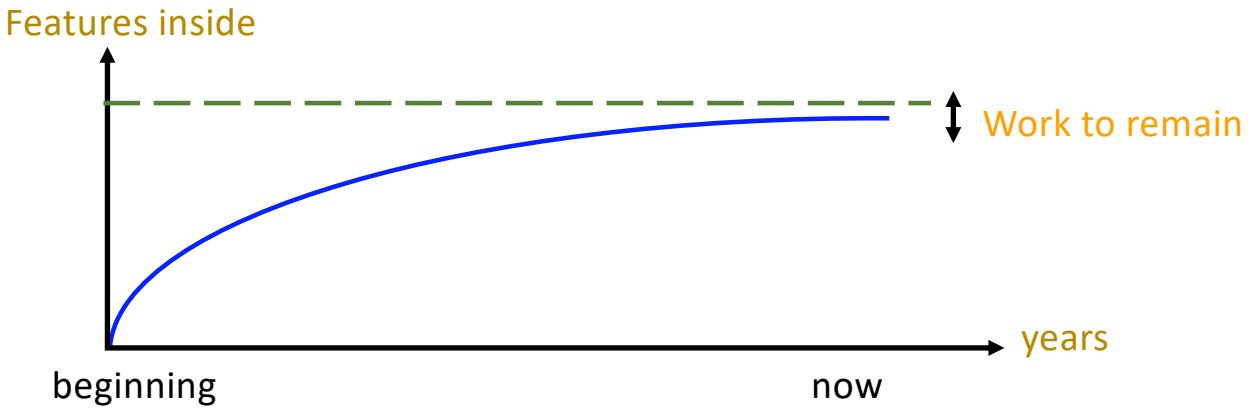
3. **Users needs**:
   - The flow tends to vanish;
   - A number of requests not used at the end (even not tested in the run’s life);
   - Priority to the well-known functionalities (before the exotic requests).

4. **Remote control**: see next slide

Direct Desktop Access	Window transfers	HTTP protocol
⊕ ▪ User interface exists ▪ **Easy to share operation** (control mode, remotely working together)	⊕	⊕ ▪ no specific applications (Safari, Chrome, Firefox,..) ▪ Allow to avoid shared operation (display mode)
⊖ ▪ Need to share operation (display mode) ▪ *Efficient* solution needed • **Timbuktu** excellent, but limited to MacOS 10.12	⊖ ▪ Limited to X11 ▪ Impossible to share operation	⊖ ▪ Needs to write an adapted HTTP server ▪ Unable to work together remotely
• Vpn + vncviewer • Both are ssh-based (*not* specific)		Added a layer in the Samba's User Interface: a side server **exists**, as a first way to distribute acquisition status and allow some control



- 12 years of upgrades in Samba
- The flux of the requests seems to reach an asymptote
  - ➢ probably no important improvement after the first months of physics run



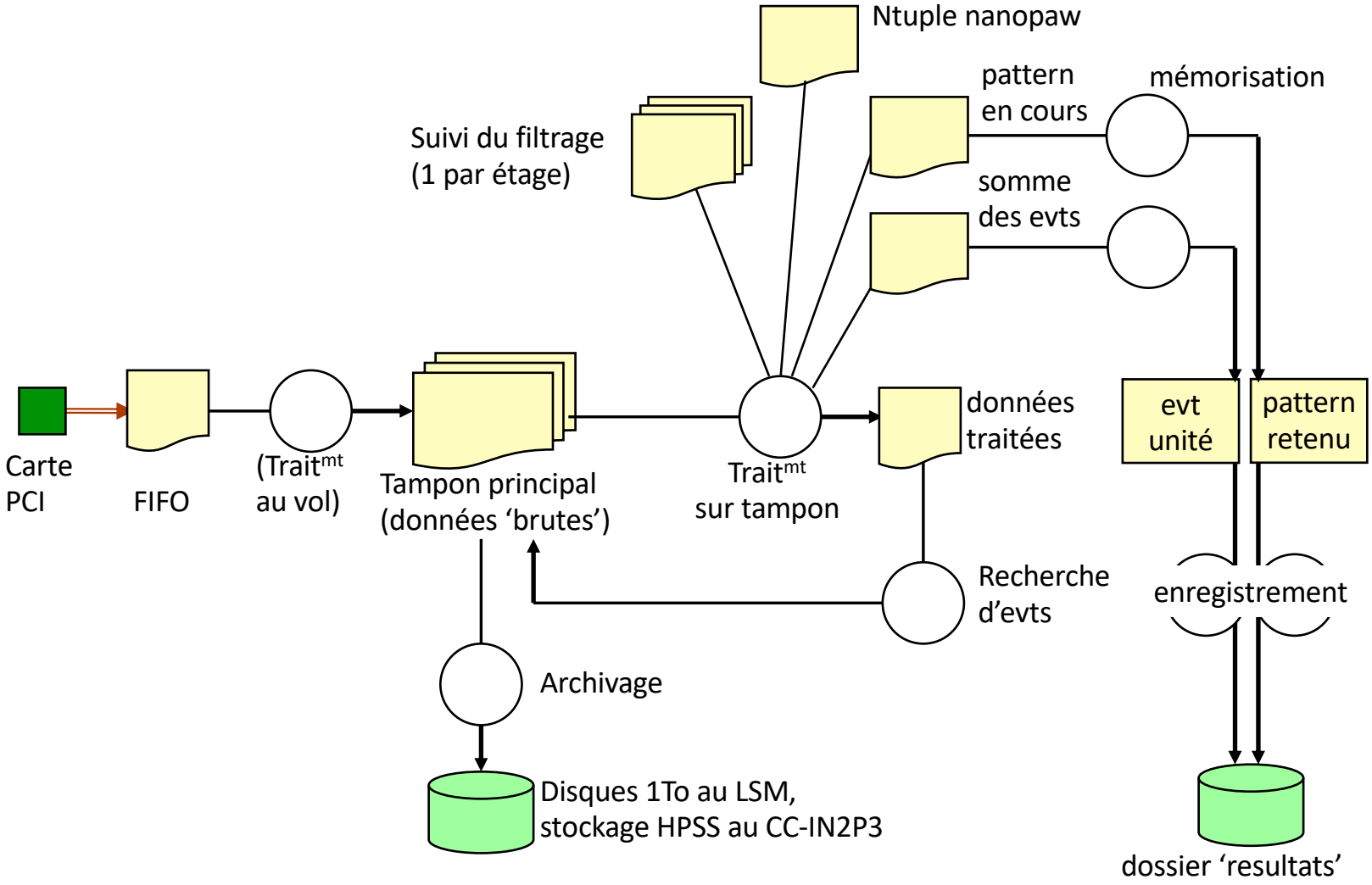
- Few features to achieve, for full completeness:
  - ✓ Slow control: externally defined JSON packets,
  - ✓ ADC boards: generic IP control,
  - ✓ Communication via HTTP,
  - ✓ Distribution packages (the pack for SPC is already available on Twiki),
  - ✓ Exhaustive User's Guide.

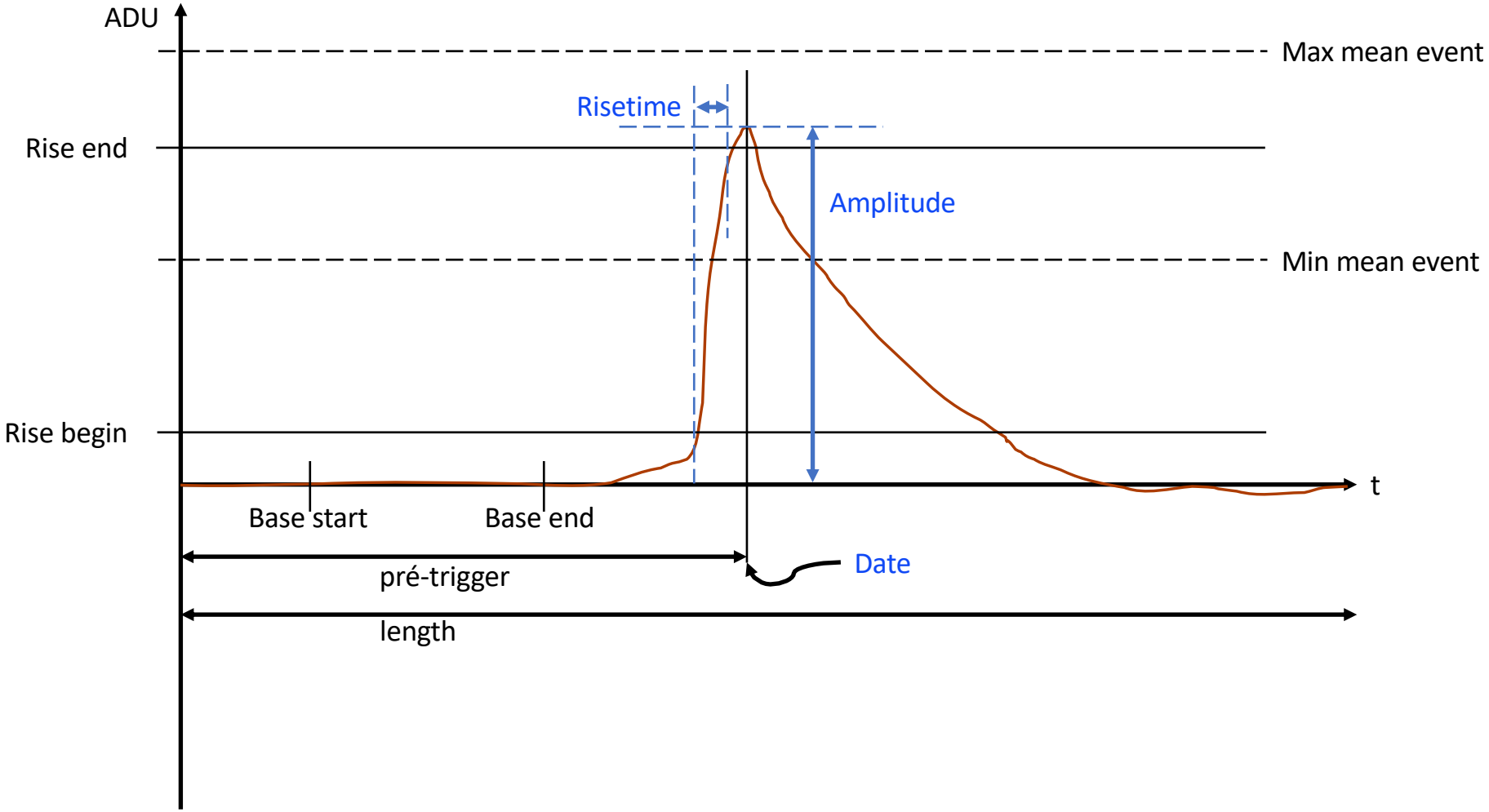
- Ability to work on future OS/computers?
  - ○ Quickdraw (window manager) still supported in the latest MacOS 10.14 (tbc);
  - ❖ Acquisition computers should stay as unmodified as possible
    - ➢ eventually avoiding these OS version changes.

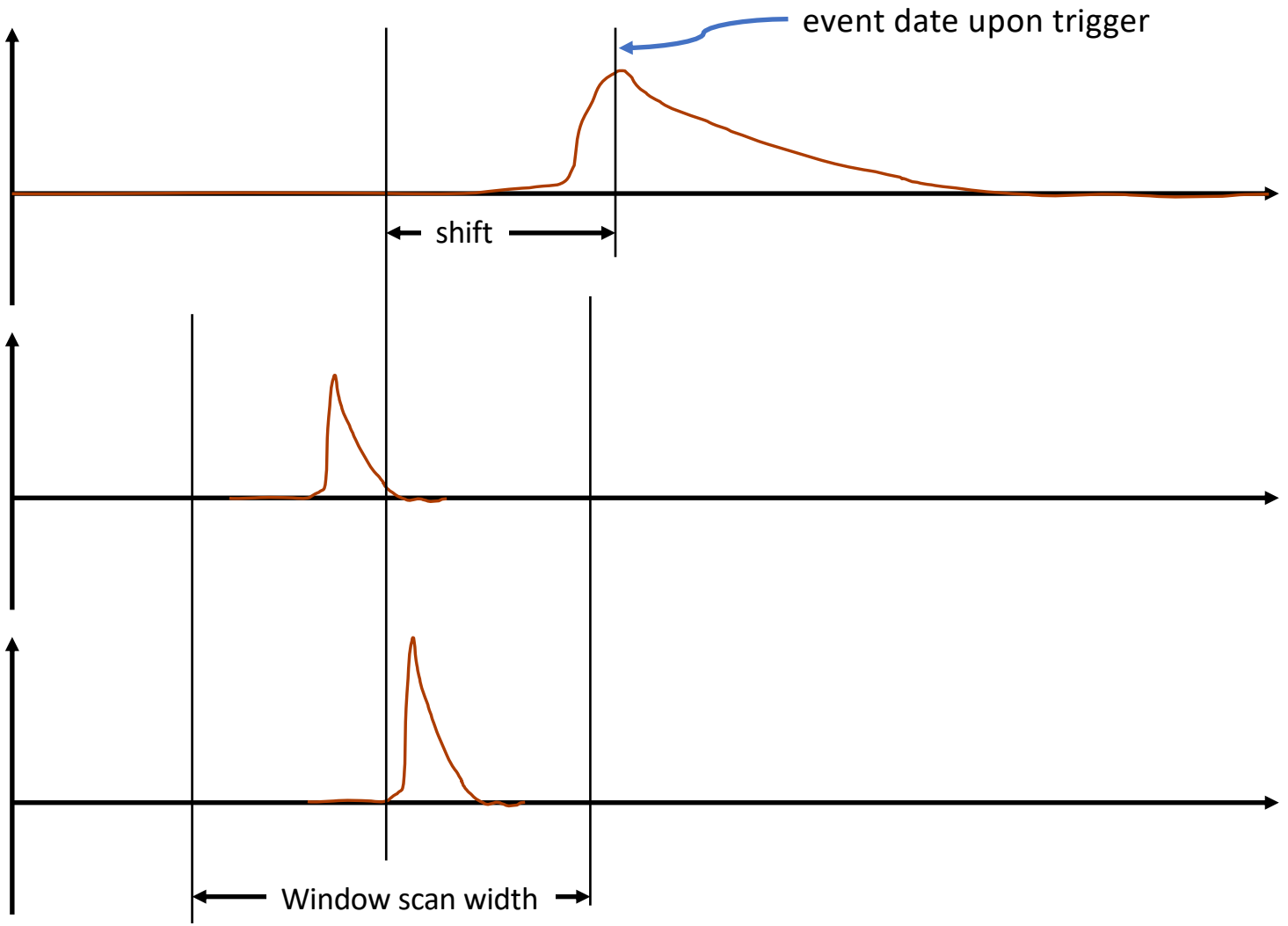
- **Full acquisition *system*:**
  - Hardware initialisation;
  - Readout and user-defined data processing without deadtime;
  - Software user-defined online trigger;
  - Data storage of stream or events, with all information in the headers;
  - Whole system control (data display, histograms, parameter management, …);

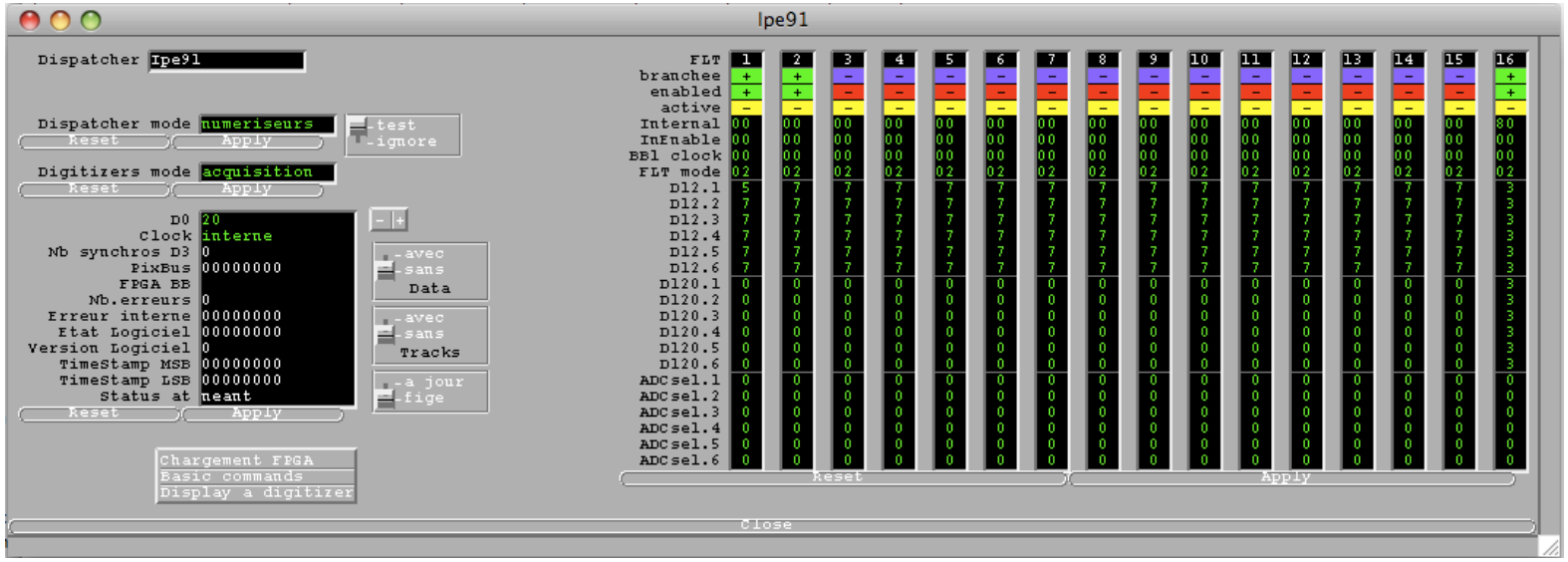
- **Version management :**
  - All previous options remain in place;
  - Evolution of the parameter set is generally transparent to the users.

- **Software distribution:**
  - A tarfile containing a single full-installation script;
  - Version chooser;
  - User-friendly graphic interface to help building the setup.


Ntuple nanopaw
pattern
en cours
mémorisation
Suivi du filtrage
(1 par étage)
somme
des evts
Carte
PCI
FIFO
(Trait^mt
au vol)
Tampon principal
(données 'brutes')
Trait^mt
sur tampon
données
traitées
evt
unité
pattern
retenu
Recherche
d'evts
enregistrement
Archivage
Disques 1To au LSM,
stockage HPSS au CC-IN2P3
dossier 'resultats'

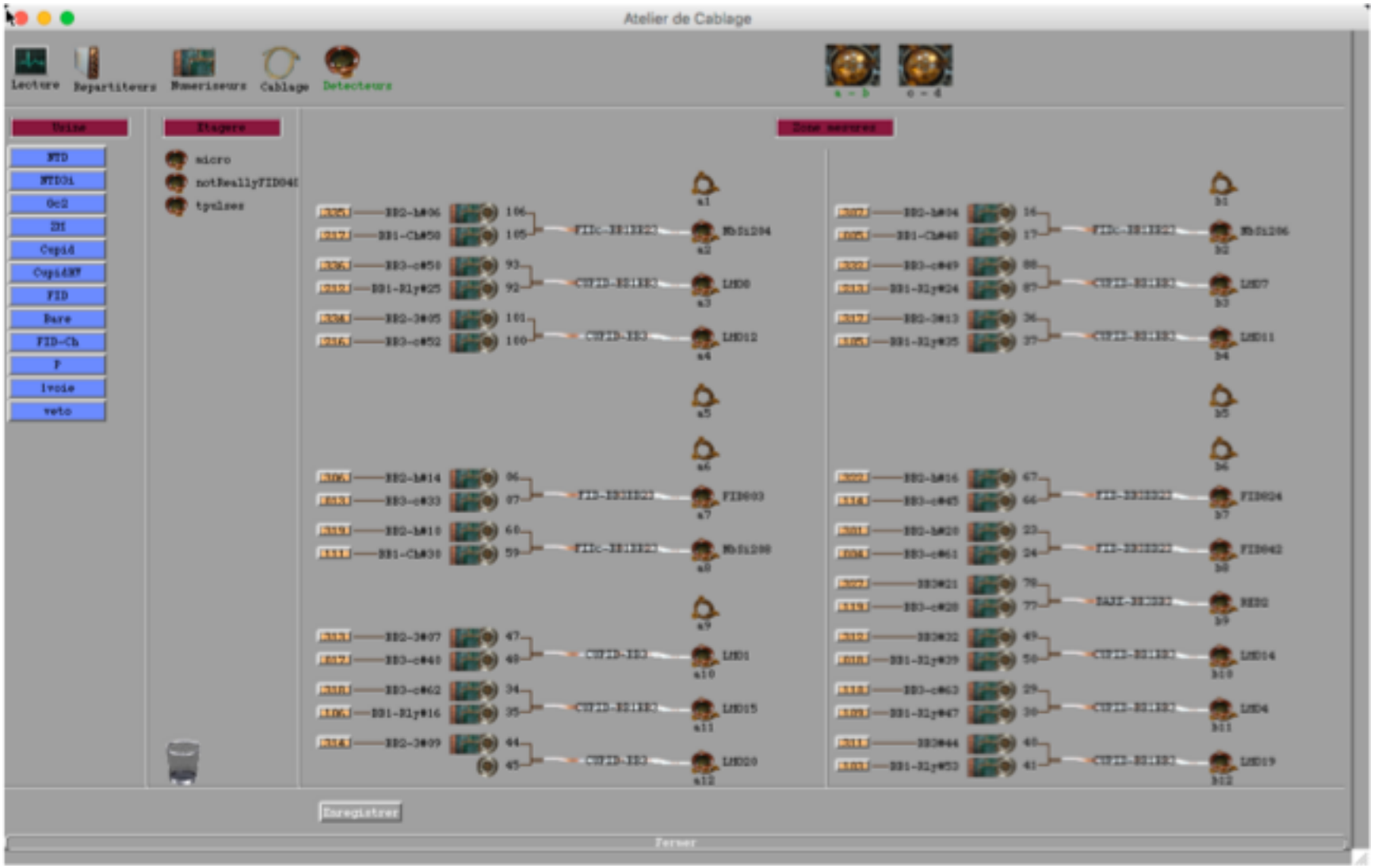

ADU
Max mean event
Risetime
Rise end
Amplitude
Min mean event
Rise begin
t
Base start
Base end
pré-trigger
Date
length

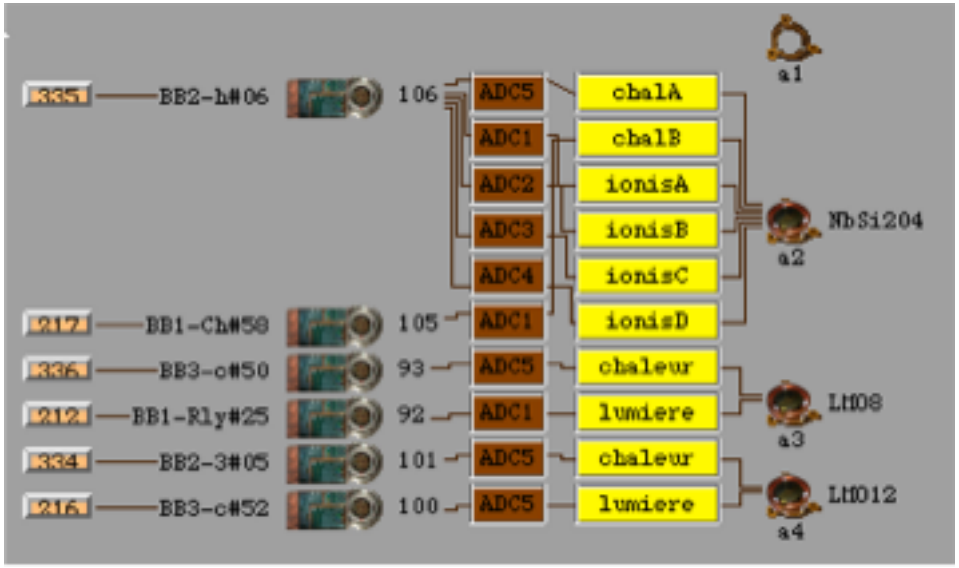

event date upon trigger
shift
Window scan width



- Tool intended to the “shifter”:
  - quick verification (all is supposed working);
  - diagnostics for simple anomalies;
  - concerns mainly the parameters to be used by Samba.

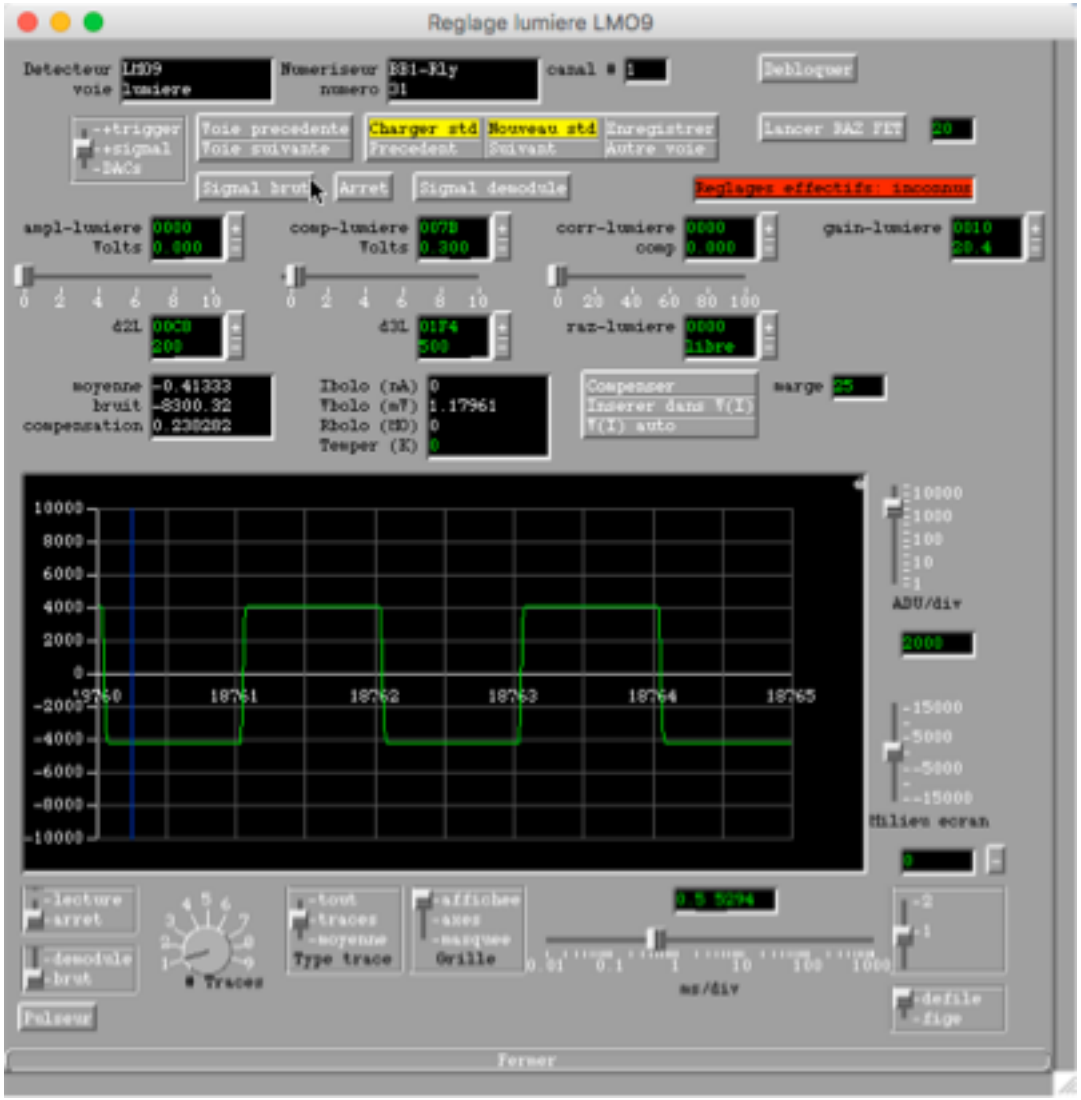
- No interference with a low-level, full diagnostic, independent tool (like the one currently build with Orca).


Atelier de Cablage
Lecture
Repartiteurs
Numeriseurs
Cablage
Detecteurs
Usine
Etagere
Zone mesures
MTD
MTD34
Gc2
2M
Cupid
Cupid8F
FID
Bare
FID-Ch
F
1voie
veto
micro
notReallyFID041
tpulses
Enregistrer
Fermer

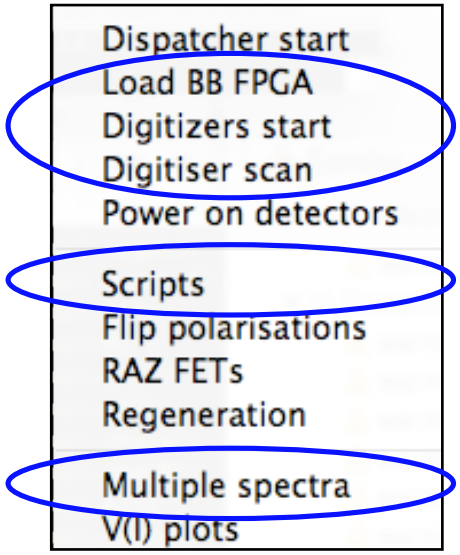

BB2-h#06
106
ADC5
chalA
ADC1
chalB
ADC2
ionisA
ADC3
ionisB
ADC4
ionisC
a1
NbSi204
a2
BB1-Ch#58
105
ADC1
ionisD
BB3-c#50
93
ADC5
chaleur
BB1-Rly#25
92
ADC1
lumiere
LtD8
a3
BB2-3#05
101
ADC5
chaleur
BB3-c#52
100
ADC5
lumiere
LtD12
a4

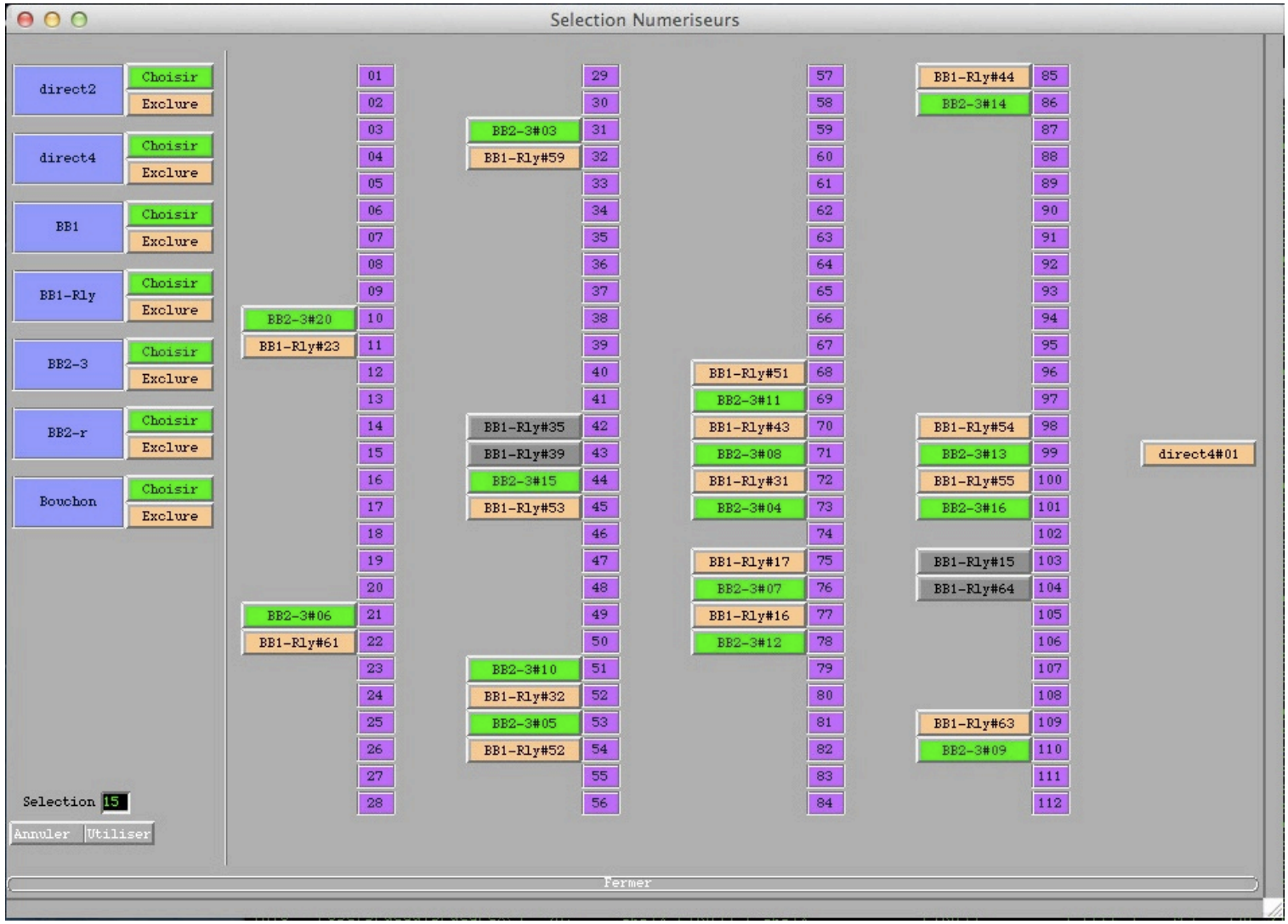

Atelier de Cablage
Lecture
Repartiteurs
Numeriseurs
Cablage
Detecteurs
Urine
Clusel 3BB
SuperClusel
Boite OPERA
Carte CALI
IPE's crate
Mini crate
Media divers
Ancien Tous
Ipe01.1
Ipe01.2
Ipe01.3
Ipe01.4
Ipe01.6
Reset Appli
FLT #9
FLT #10
FLT #11
FLT #12
BB1-Kly#31
BB3-c#59
BB1-Kly#34
BB3#23
BB1-Kly#35
BB2-3#13
BB3-c#52
BB2-3#05
BB3-c#51
BB3#41
BB1-Kly#25
BB3-c#50
BB1-Kly#46
(ignoree)
BB1-Kly#43
BB3-c#39
BB1-Kly#39
BB3#32
BB3-c#40
BB2-3#07
BB1-Kly#16
BB3-c#62
BB1-Kly#47
BB3-c#63
lumiere LED9
lumiere LED10
lumiere LED11
lumiere LED8
lumiere LED17
lumiere LED16
lumiere LED14
lumiere LED15
lumiere LED4
chaleur LED9
chaleur LED10
chaleur LED11
lumiere LED12
chaleur LED12
lumiere LED5
chaleur LED5
chaleur LED8
chaleur LED16
chaleur LED14
lumiere LED1
chaleur LED1
chaleur LED15
chaleur LED4
Enregistrer
Fermer

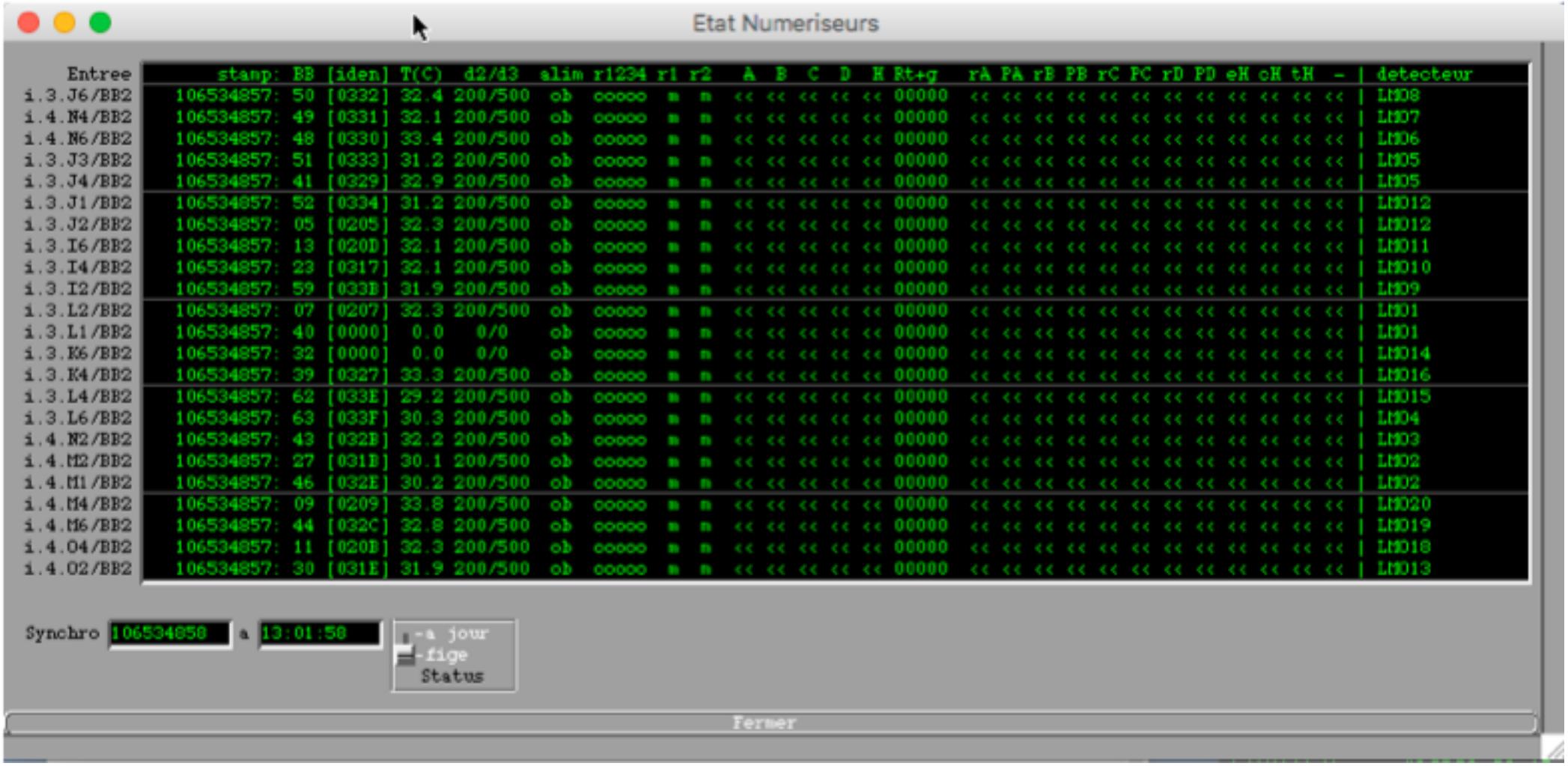
This window is dynamically build after the model definition external text file

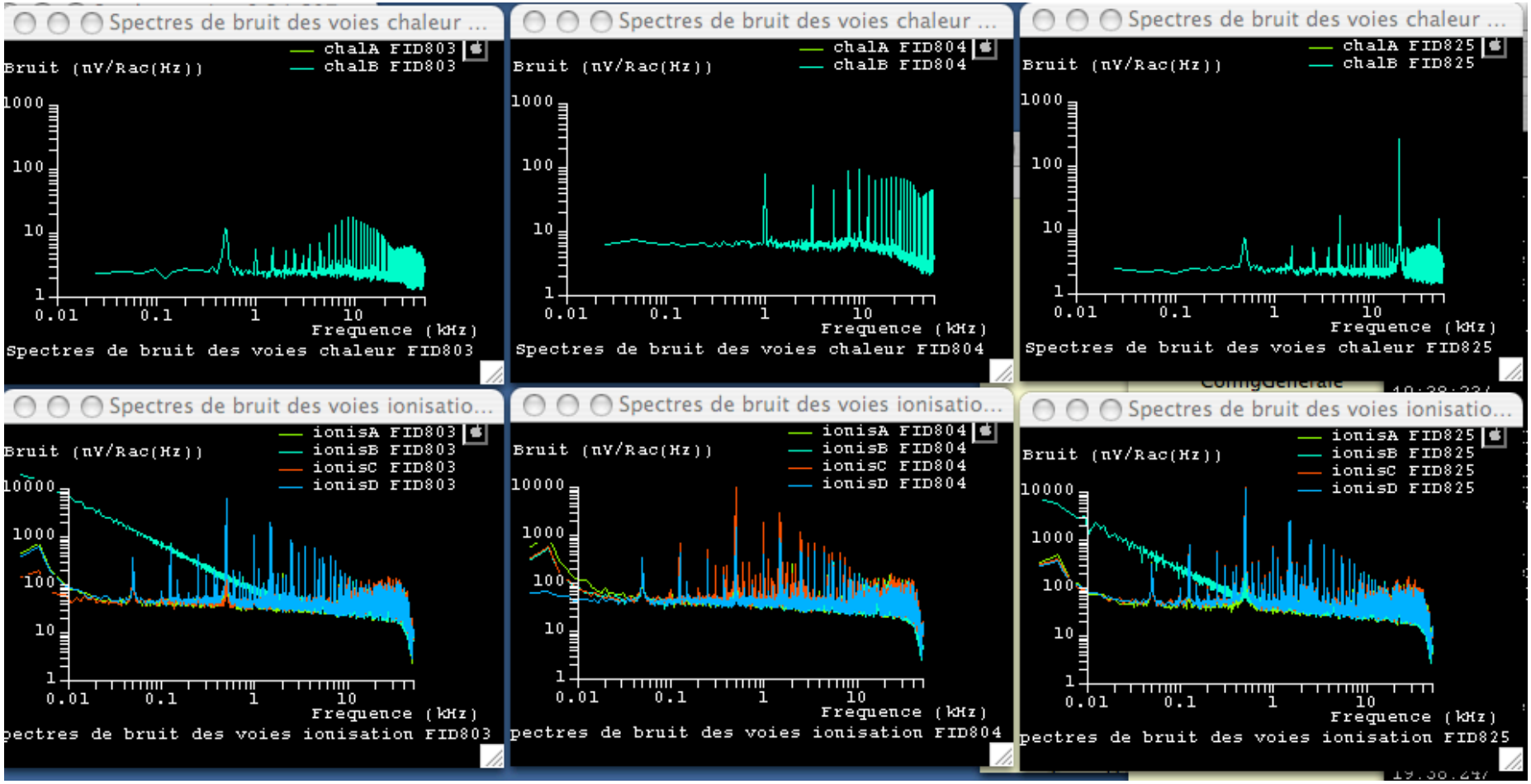


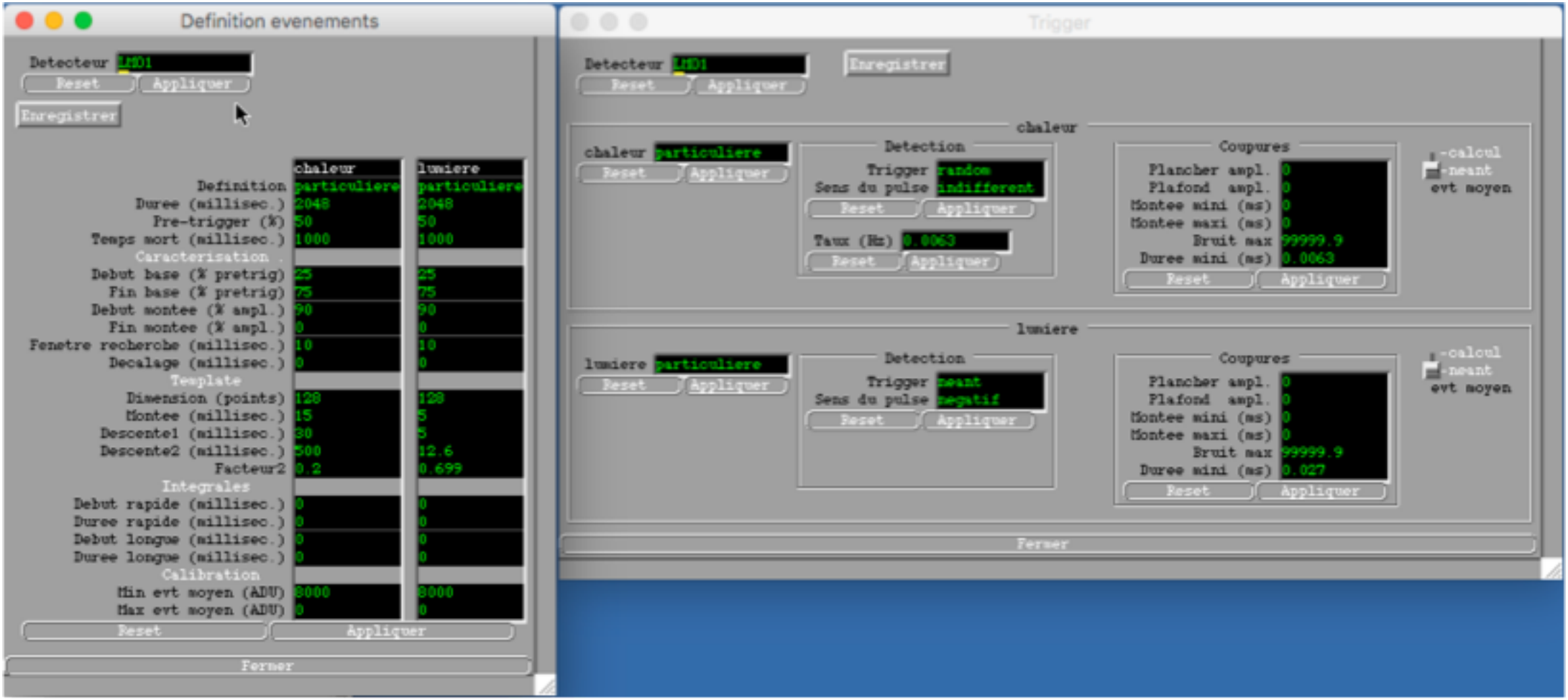
This window is dynamically build after the model definition external text file

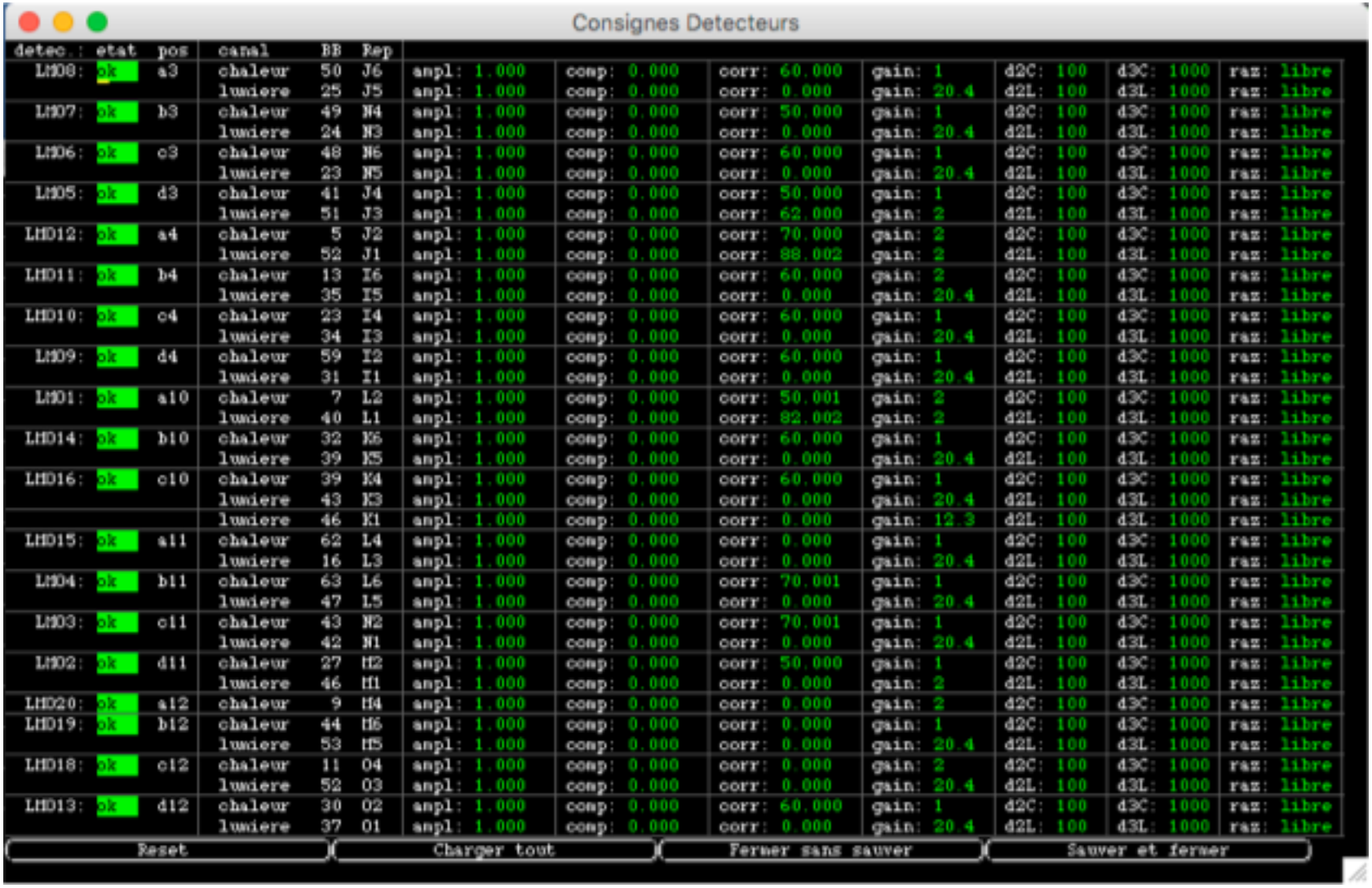

Dispatcher start
Load BB FPGA
Digitizers start
Digitiser scan
Power on detectors
Scripts
Flip polarisations
RAZ FETs
Regeneration
Multiple spectra
V(I) plots

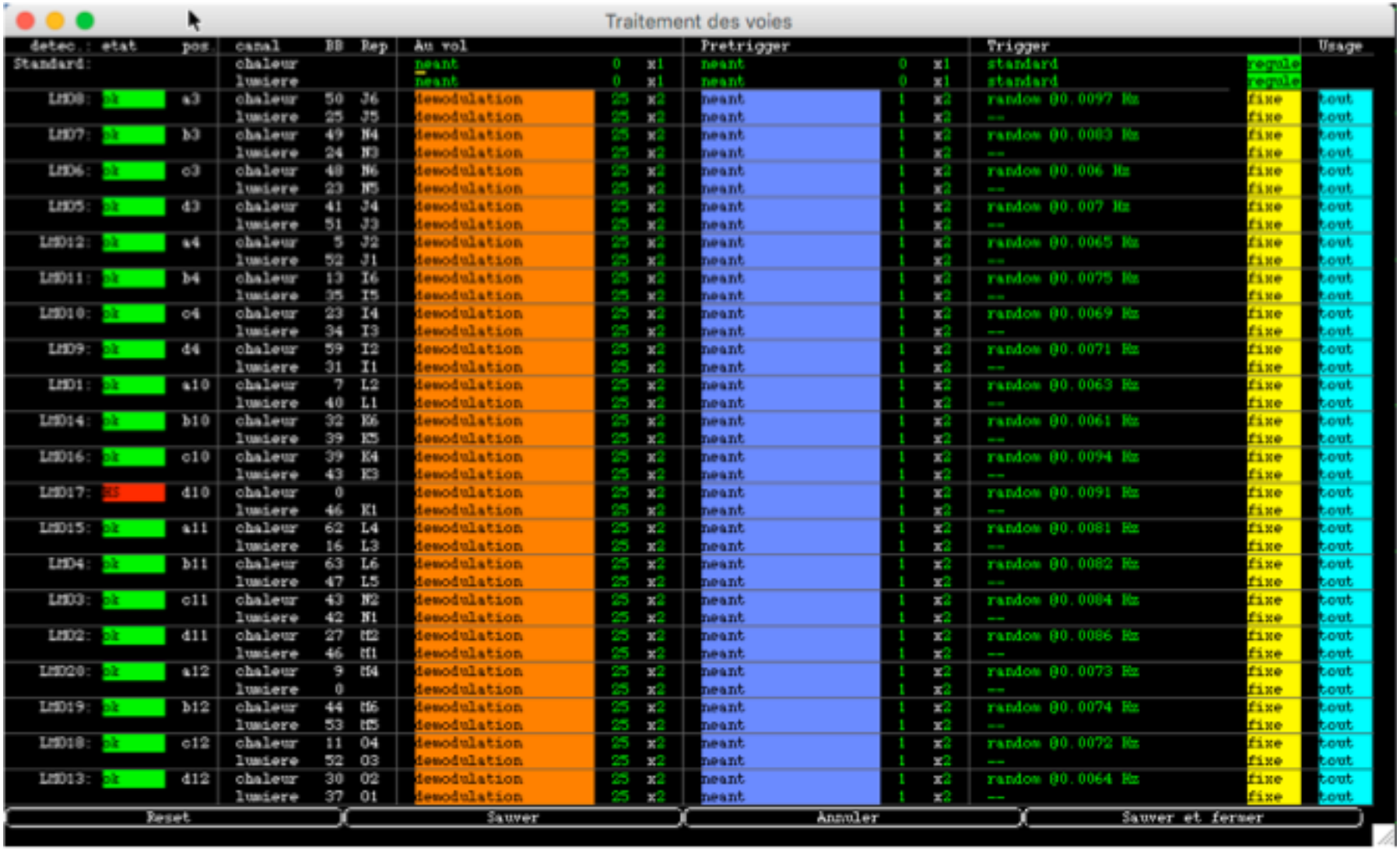

Selection Numeriseurs
direct2
Choisir
Exclure
direct4
Choisir
Exclure
BB1
Choisir
Exclure
BB1-Rly
Choisir
Exclure
BB2-3
Choisir
Exclure
BB2-r
Choisir
Exclure
Bouchon
Choisir
Exclure
Selection 15
Annuler
Utiliser
01
02
03
04
05
06
07
08
09
BB2-3#20
10
BB1-Rly#23
11
12
13
14
15
16
17
18
19
20
BB2-3#06
21
BB1-Rly#61
22
23
24
25
26
27
28
29
30
BB2-3#03
31
BB1-Rly#59
32
33
34
35
36
37
38
39
40
41
BB1-Rly#35
42
BB1-Rly#39
43
BB2-3#15
44
BB1-Rly#53
45
46
47
48
49
50
BB2-3#10
51
BB1-Rly#32
52
BB2-3#05
53
BB1-Rly#52
54
55
56
57
58
59
60
61
62
63
64
65
66
67
BB1-Rly#51
68
BB2-3#11
69
BB1-Rly#43
70
BB2-3#08
71
BB1-Rly#31
72
BB2-3#04
73
74
BB1-Rly#17
75
BB2-3#07
76
BB1-Rly#16
77
BB2-3#12
78
79
80
81
82
83
84
BB1-Rly#44
85
BB2-3#14
86
87
88
89
90
91
92
93
94
95
96
97
BB1-Rly#54
98
BB2-3#13
99
BB1-Rly#55
100
BB2-3#16
101
102
BB1-Rly#15
103
BB1-Rly#64
104
105
106
107
108
BB1-Rly#63
109
BB2-3#09
110
111
112
direct4#01
Fermer


Etat Numeriseurs
Entree | stamp: BB [iden] T(C) d2/d3 alim r1234 r1 r2 A B C D H Rt+g rA PA rB PB rC PC rD PD eH oH tH - | detecteur
i.3.J6/BB2 | 106534857: 50 [0332] 32.4 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM08
i.4.N4/BB2 | 106534857: 49 [0331] 32.1 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM07
i.4.N6/BB2 | 106534857: 48 [0330] 33.4 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM06
i.3.J3/BB2 | 106534857: 51 [0333] 31.2 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM05
i.3.J4/BB2 | 106534857: 41 [0329] 32.9 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM05
i.3.J1/BB2 | 106534857: 52 [0334] 31.2 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM012
i.3.J2/BB2 | 106534857: 05 [0205] 32.3 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM012
i.3.I6/BB2 | 106534857: 13 [020D] 32.1 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM011
i.3.I4/BB2 | 106534857: 23 [0317] 32.1 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM010
i.3.I2/BB2 | 106534857: 59 [033B] 31.9 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM09
i.3.L2/BB2 | 106534857: 07 [0207] 32.3 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM01
i.3.L1/BB2 | 106534857: 40 [0000] 0.0 0/0 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM01
i.3.K6/BB2 | 106534857: 32 [0000] 0.0 0/0 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM014
i.3.K4/BB2 | 106534857: 39 [0327] 33.3 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM016
i.3.L4/BB2 | 106534857: 62 [033E] 29.2 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM015
i.3.L6/BB2 | 106534857: 63 [033F] 30.3 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM04
i.4.N2/BB2 | 106534857: 43 [032B] 32.2 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM03
i.4.M2/BB2 | 106534857: 27 [031B] 30.1 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM02
i.4.M1/BB2 | 106534857: 46 [032E] 30.2 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM02
i.4.M4/BB2 | 106534857: 09 [0209] 33.8 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM020
i.4.M6/BB2 | 106534857: 44 [032C] 32.8 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM019
i.4.O4/BB2 | 106534857: 11 [020B] 32.3 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM018
i.4.O2/BB2 | 106534857: 30 [031E] 31.9 200/500 ob ooooo m m << << << << << 00000 << << << << << << << << << << << | LM013
Synchro 106534858 a 13:01:58
a jour
figé
Status
Fermer


Spectres de bruit des voies chaleur ...
chalA FID803
chalB FID803
Bruit (nV/Rac(Hz))
Frequence (kHz)
Spectres de bruit des voies chaleur FID803
Spectres de bruit des voies chaleur ...
chalA FID804
chalB FID804
Bruit (nV/Rac(Hz))
Frequence (kHz)
Spectres de bruit des voies chaleur FID804
Spectres de bruit des voies chaleur ...
chalA FID825
chalB FID825
Bruit (nV/Rac(Hz))
Frequence (kHz)
Spectres de bruit des voies chaleur FID825
Spectres de bruit des voies ionisatio...
ionisA FID803
ionisB FID803
ionisC FID803
ionisD FID803
Bruit (nV/Rac(Hz))
Frequence (kHz)
pectres de bruit des voies ionisation FID803
Spectres de bruit des voies ionisatio...
ionisA FID804
ionisB FID804
ionisC FID804
ionisD FID804
Bruit (nV/Rac(Hz))
Frequence (kHz)
pectres de bruit des voies ionisation FID804
Spectres de bruit des voies ionisatio...
ionisA FID825
ionisB FID825
ionisC FID825
ionisD FID825
Bruit (nV/Rac(Hz))
Frequence (kHz)
pectres de bruit des voies ionisation FID825


Definition evenements
Detecteur LMD1
Reset
Appliquer
Enregistrer
chaleur
lumiere
Definition particuliere particuliere
Duree (millisec.) 2048 2048
Pre-trigger (%) 50 50
Temps mort (millisec.) 1000 1000
Caracterisation
Debut base (% pretrig) 25 25
Fin base (% pretrig) 75 75
Debut montee (% ampl.) 90 90
Fin montee (% ampl.) 0 0
Fenetre recherche (millisec.) 10 10
Decalage (millisec.) 0 0
Template
Dimension (points) 128 128
Montee (millisec.) 15 5
Descente1 (millisec.) 30 5
Descente2 (millisec.) 500 12.6
Facteur2 0.2 0.699
Integrales
Debut rapide (millisec.) 0 0
Duree rapide (millisec.) 0 0
Debut longue (millisec.) 0 0
Duree longue (millisec.) 0 0
Calibration
Min evt moyen (ADU) 8000 8000
Max evt moyen (ADU) 0 0
Reset
Appliquer
Fermer
Trigger
Detecteur LMD1
Reset
Appliquer
Enregistrer
chaleur
chaleur particuliere
Reset
Appliquer
Detection
Trigger random
Sens du pulse indifferent
Reset
Appliquer
Taux (Hz) 0.0063
Reset
Appliquer
Coupures
Plancher ampl. 0
Plafond ampl. 0
Montee mini (ms) 0
Montee maxi (ms) 0
Bruit max 99999.9
Duree mini (ms) 0.0063
Reset
Appliquer
calcul
moyenne
evt moyen
lumiere
lumiere particuliere
Reset
Appliquer
Detection
Trigger moyenne
Sens du pulse negatif
Reset
Appliquer
Coupures
Plancher ampl. 0
Plafond ampl. 0
Montee mini (ms) 0
Montee maxi (ms) 0
Bruit max 99999.9
Duree mini (ms) 0.027
Reset
Appliquer
calcul
moyenne
evt moyen
Fermer


Consignes Detecteurs
detec. : etat pos canal BB Rep
LMD8: ok a3 chaleur 50 J6 ampl: 1.000 comp: 0.000 corr: 60.000 gain: 1 d2C: 100 d3C: 1000 raz: libre
lumiere 25 J5 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 20.4 d2L: 100 d3L: 1000 raz: libre
LMD7: ok b3 chaleur 49 N4 ampl: 1.000 comp: 0.000 corr: 50.000 gain: 1 d2C: 100 d3C: 1000 raz: libre
lumiere 24 N3 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 20.4 d2L: 100 d3L: 1000 raz: libre
LMD6: ok c3 chaleur 48 N6 ampl: 1.000 comp: 0.000 corr: 60.000 gain: 1 d2C: 100 d3C: 1000 raz: libre
lumiere 23 N5 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 20.4 d2L: 100 d3L: 1000 raz: libre
LMD5: ok d3 chaleur 41 J4 ampl: 1.000 comp: 0.000 corr: 50.000 gain: 1 d2C: 100 d3C: 1000 raz: libre
lumiere 51 J3 ampl: 1.000 comp: 0.000 corr: 62.000 gain: 2 d2L: 100 d3L: 1000 raz: libre
LMD12: ok a4 chaleur 5 J2 ampl: 1.000 comp: 0.000 corr: 70.000 gain: 2 d2C: 100 d3C: 1000 raz: libre
lumiere 52 J1 ampl: 1.000 comp: 0.000 corr: 88.002 gain: 2 d2L: 100 d3L: 1000 raz: libre
LMD11: ok b4 chaleur 13 I6 ampl: 1.000 comp: 0.000 corr: 60.000 gain: 2 d2C: 100 d3C: 1000 raz: libre
lumiere 35 I5 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 20.4 d2L: 100 d3L: 1000 raz: libre
LMD10: ok c4 chaleur 23 I4 ampl: 1.000 comp: 0.000 corr: 60.000 gain: 1 d2C: 100 d3C: 1000 raz: libre
lumiere 34 I3 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 20.4 d2L: 100 d3L: 1000 raz: libre
LMD9: ok d4 chaleur 59 I2 ampl: 1.000 comp: 0.000 corr: 60.000 gain: 1 d2C: 100 d3C: 1000 raz: libre
lumiere 31 I1 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 20.4 d2L: 100 d3L: 1000 raz: libre
LMD1: ok a10 chaleur 7 L2 ampl: 1.000 comp: 0.000 corr: 50.001 gain: 2 d2C: 100 d3C: 1000 raz: libre
lumiere 40 L1 ampl: 1.000 comp: 0.000 corr: 82.002 gain: 2 d2L: 100 d3L: 1000 raz: libre
LMD14: ok b10 chaleur 32 K6 ampl: 1.000 comp: 0.000 corr: 60.000 gain: 1 d2C: 100 d3C: 1000 raz: libre
lumiere 39 K5 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 20.4 d2L: 100 d3L: 1000 raz: libre
LMD16: ok c10 chaleur 39 K4 ampl: 1.000 comp: 0.000 corr: 60.000 gain: 1 d2C: 100 d3C: 1000 raz: libre
lumiere 43 K3 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 20.4 d2L: 100 d3L: 1000 raz: libre
lumiere 46 K1 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 12.3 d2L: 100 d3L: 1000 raz: libre
LMD15: ok a11 chaleur 62 L4 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 1 d2C: 100 d3C: 1000 raz: libre
lumiere 16 L3 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 20.4 d2L: 100 d3L: 1000 raz: libre
LMD4: ok b11 chaleur 63 L6 ampl: 1.000 comp: 0.000 corr: 70.001 gain: 1 d2C: 100 d3C: 1000 raz: libre
lumiere 47 L5 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 20.4 d2L: 100 d3L: 1000 raz: libre
LMD3: ok c11 chaleur 43 N2 ampl: 1.000 comp: 0.000 corr: 70.001 gain: 1 d2C: 100 d3C: 1000 raz: libre
lumiere 42 N1 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 20.4 d2L: 100 d3L: 1000 raz: libre
LMD2: ok d11 chaleur 27 M2 ampl: 1.000 comp: 0.000 corr: 50.000 gain: 1 d2C: 100 d3C: 1000 raz: libre
lumiere 46 M1 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 2 d2L: 100 d3L: 1000 raz: libre
LMD20: ok a12 chaleur 9 M4 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 2 d2C: 100 d3C: 1000 raz: libre
LMD19: ok b12 chaleur 44 M6 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 1 d2C: 100 d3C: 1000 raz: libre
lumiere 53 M5 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 20.4 d2L: 100 d3L: 1000 raz: libre
LMD18: ok c12 chaleur 11 04 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 2 d2C: 100 d3C: 1000 raz: libre
lumiere 52 03 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 20.4 d2L: 100 d3L: 1000 raz: libre
LMD13: ok d12 chaleur 30 02 ampl: 1.000 comp: 0.000 corr: 60.000 gain: 1 d2C: 100 d3C: 1000 raz: libre
lumiere 37 01 ampl: 1.000 comp: 0.000 corr: 0.000 gain: 20.4 d2L: 100 d3L: 1000 raz: libre
Reset
Charger tout
Fermer sans sauver
Sauver et fermer


Traitement des voies
detec.: etat pos canal BB Rep Au vol Pretrigger Trigger Usage
Standard: chaleur neant 0 x1 neant 0 x1 standard regule
lumiere neant 0 x1 neant 0 x1 standard regule
LMD8: pk a3 chaleur 50 J6 demodulation 25 x2 neant 1 x2 random @0.0097 Hz fixe tout
lumiere 25 J5 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD7: pk b3 chaleur 49 N4 demodulation 25 x2 neant 1 x2 random @0.0083 Hz fixe tout
lumiere 24 N3 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD6: pk c3 chaleur 48 N6 demodulation 25 x2 neant 1 x2 random @0.006 Hz fixe tout
lumiere 23 N5 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD5: pk d3 chaleur 41 J4 demodulation 25 x2 neant 1 x2 random @0.007 Hz fixe tout
lumiere 51 J3 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD12: pk a4 chaleur 5 J2 demodulation 25 x2 neant 1 x2 random @0.0065 Hz fixe tout
lumiere 52 J1 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD11: pk b4 chaleur 13 I6 demodulation 25 x2 neant 1 x2 random @0.0075 Hz fixe tout
lumiere 35 I5 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD10: pk c4 chaleur 23 I4 demodulation 25 x2 neant 1 x2 random @0.0069 Hz fixe tout
lumiere 34 I3 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD9: pk d4 chaleur 59 I2 demodulation 25 x2 neant 1 x2 random @0.0071 Hz fixe tout
lumiere 31 I1 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD1: pk a10 chaleur 7 L2 demodulation 25 x2 neant 1 x2 random @0.0063 Hz fixe tout
lumiere 40 L1 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD14: pk b10 chaleur 32 K6 demodulation 25 x2 neant 1 x2 random @0.0061 Hz fixe tout
lumiere 39 K5 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD16: pk c10 chaleur 39 K4 demodulation 25 x2 neant 1 x2 random @0.0094 Hz fixe tout
lumiere 43 K3 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD17: KO d10 chaleur 0 demodulation 25 x2 neant 1 x2 random @0.0091 Hz fixe tout
lumiere 46 K1 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD15: pk a11 chaleur 62 L4 demodulation 25 x2 neant 1 x2 random @0.0081 Hz fixe tout
lumiere 16 L3 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD4: pk b11 chaleur 63 L6 demodulation 25 x2 neant 1 x2 random @0.0082 Hz fixe tout
lumiere 47 L5 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD3: pk c11 chaleur 43 M2 demodulation 25 x2 neant 1 x2 random @0.0084 Hz fixe tout
lumiere 42 M1 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD2: pk d11 chaleur 27 M2 demodulation 25 x2 neant 1 x2 random @0.0086 Hz fixe tout
lumiere 46 M1 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD20: pk a12 chaleur 9 M4 demodulation 25 x2 neant 1 x2 random @0.0073 Hz fixe tout
lumiere 0 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD19: pk b12 chaleur 44 M6 demodulation 25 x2 neant 1 x2 random @0.0074 Hz fixe tout
lumiere 53 M5 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD18: pk c12 chaleur 11 O4 demodulation 25 x2 neant 1 x2 random @0.0072 Hz fixe tout
lumiere 52 O3 demodulation 25 x2 neant 1 x2 -- fixe tout
LMD13: pk d12 chaleur 30 O2 demodulation 25 x2 neant 1 x2 random @0.0064 Hz fixe tout
lumiere 37 O1 demodulation 25 x2 neant 1 x2 -- fixe tout
Reset
Sauver
Annuler
Sauver et fermer

Saving raw data + random “events” for 20 detectors: 20% of the available CPU power