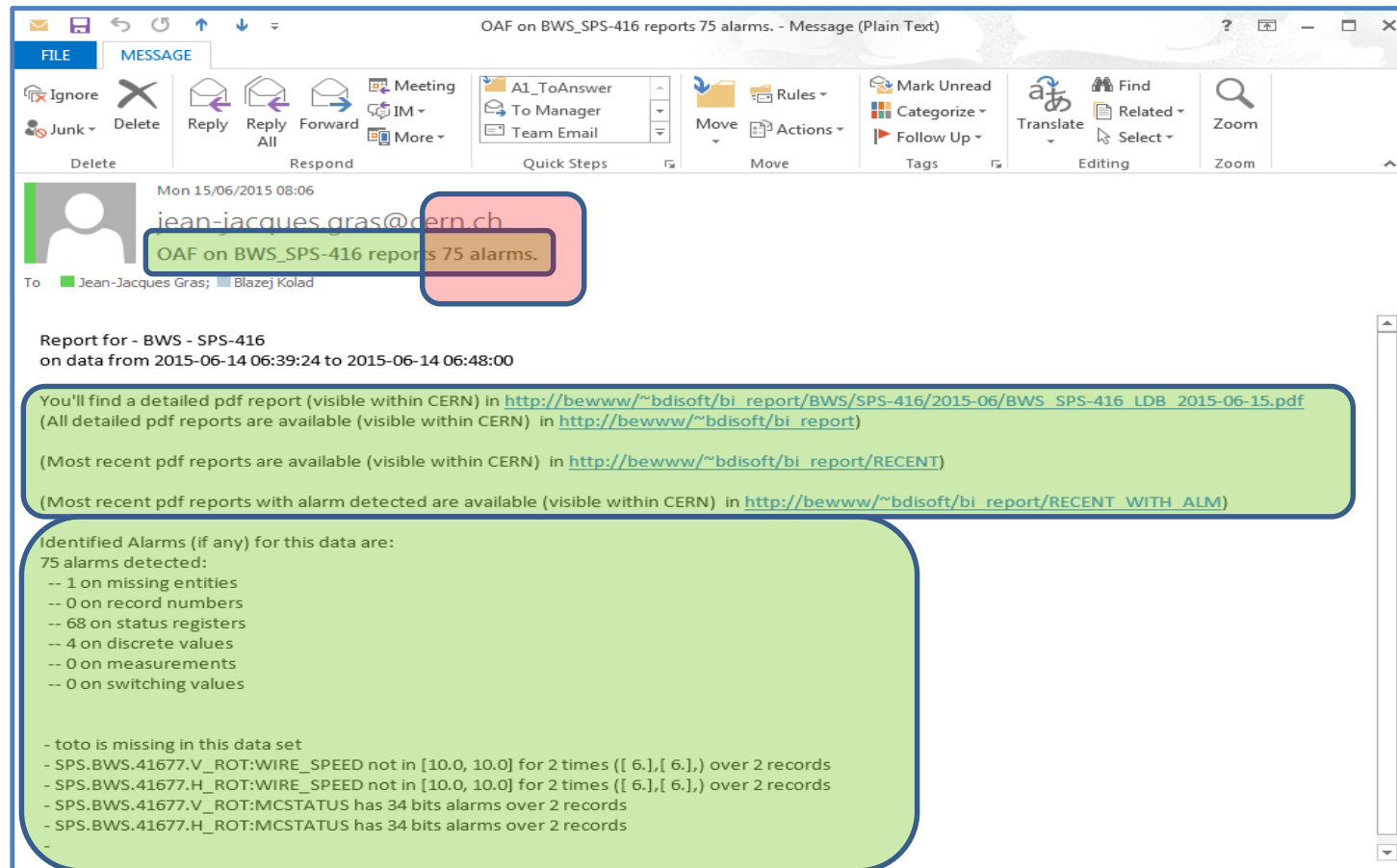


# BI Offline Algorithm Framework

Some Examples of What It Can Do for  
Us

# Main Tools: emailing

- Once report is done, informative email will be sent to configured recipient with link towards report and summary of alarms





# Report on number of DB records alarm

Gray background -> No Alarm set

Red background -> Alarm (min,max nb of records) set and detected for this variable.

Green background -> Alarm configured but not detected.

N.B.: ACQTIMEINCYCLE\_IN alarm has been: 'Should have same nb as ACQ\_STATE, so it's Green even for this large number of scans

	PR.BWS.65.H_ROT	PR.BWS.85.V_ROT
ACQTIMEINCYCLE_IN	95	52
ACQTIMEINCYCLE_OUT	95	52
ACQ_CLOCK_DIV	95	52
ACQ_DELAY	95	52
ACQ_GATE	95	52
ACQ_MSG	61	42
ACQ_STATE	95	52
ACQ_TIME	95	52
ACQ_TYPE	95	52
AMP_IN	95	52
AMP_OUT	95	52
BUNCH_LIST	95	52
BUNCH_SELECTION	95	52
CLOCK SIG SOURCE	95	52

# Table for status bit alarms

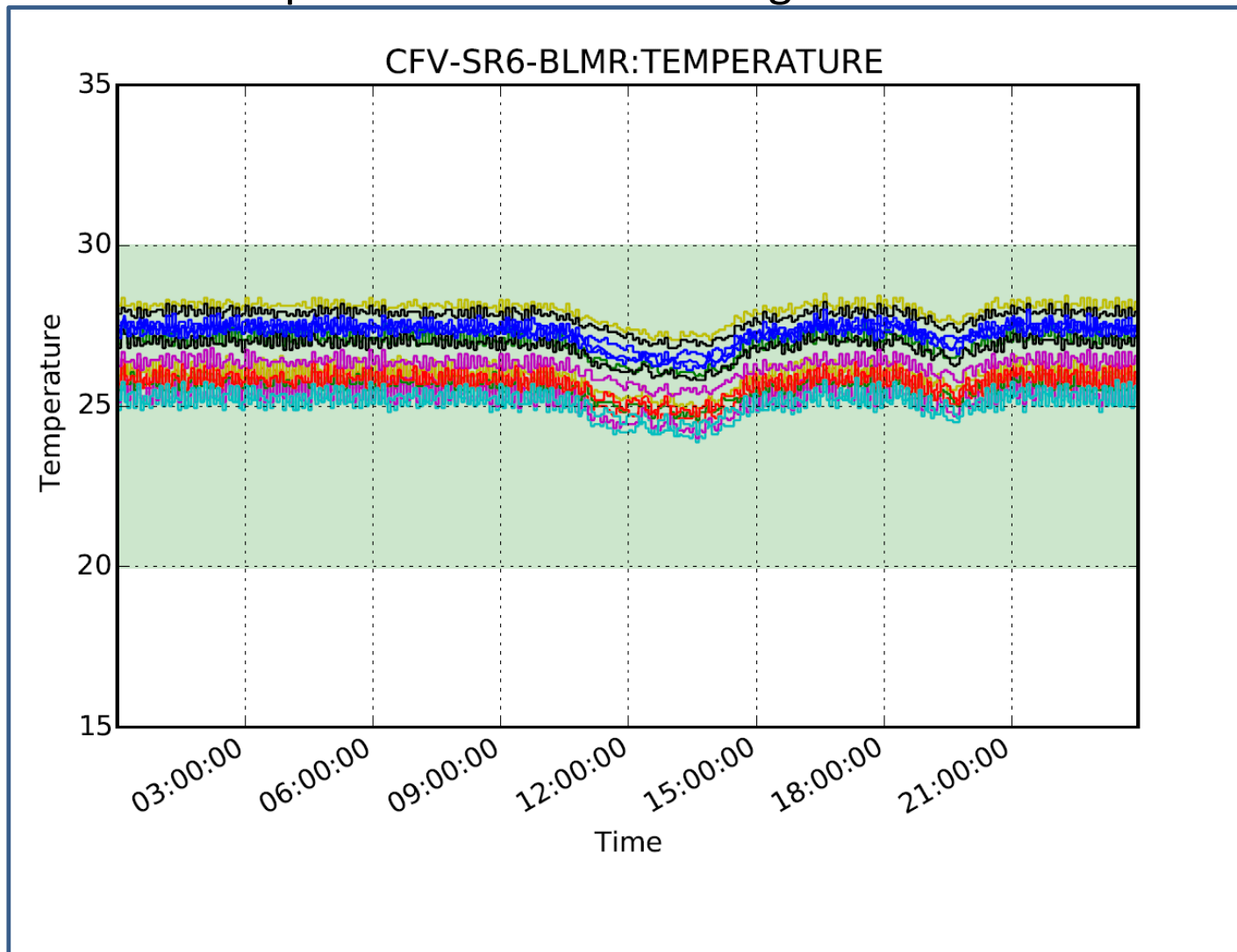
Bits are set to red background when they are found not to be ON or OFF as they should have as declared in the configuration. The number of records is reminded for info.

	PR.BWS.65.H_ROT	PR.BWS.85.V_ROT
NOT_OK	0 / 95	0 / 52
BAD_QUAL	0 / 95	0 / 52
DIFF_FROM_STT	0 / 95	0 / 52
OUT_OF_RANGE	0 / 95	0 / 52
BUSY	0 / 95	0 / 52
TIMEOUT	0 / 95	0 / 52
SAT_IN	12 / 95	10 / 52
SAT_OUT	13 / 95	6 / 52
uu8	0 / 95	0 / 52
uu9	0 / 95	0 / 52
uu10	0 / 95	0 / 52
uu11	0 / 95	0 / 52
uu12	0 / 95	0 / 52
uu13	0 / 95	0 / 52
uu14	0 / 95	0 / 52
uu15	0 / 95	0 / 52
uu16	0 / 95	0 / 52
uu17	0 / 95	0 / 52
uu18	0 / 95	0 / 52
uu19	0 / 95	0 / 52
uu20	0 / 95	0 / 52



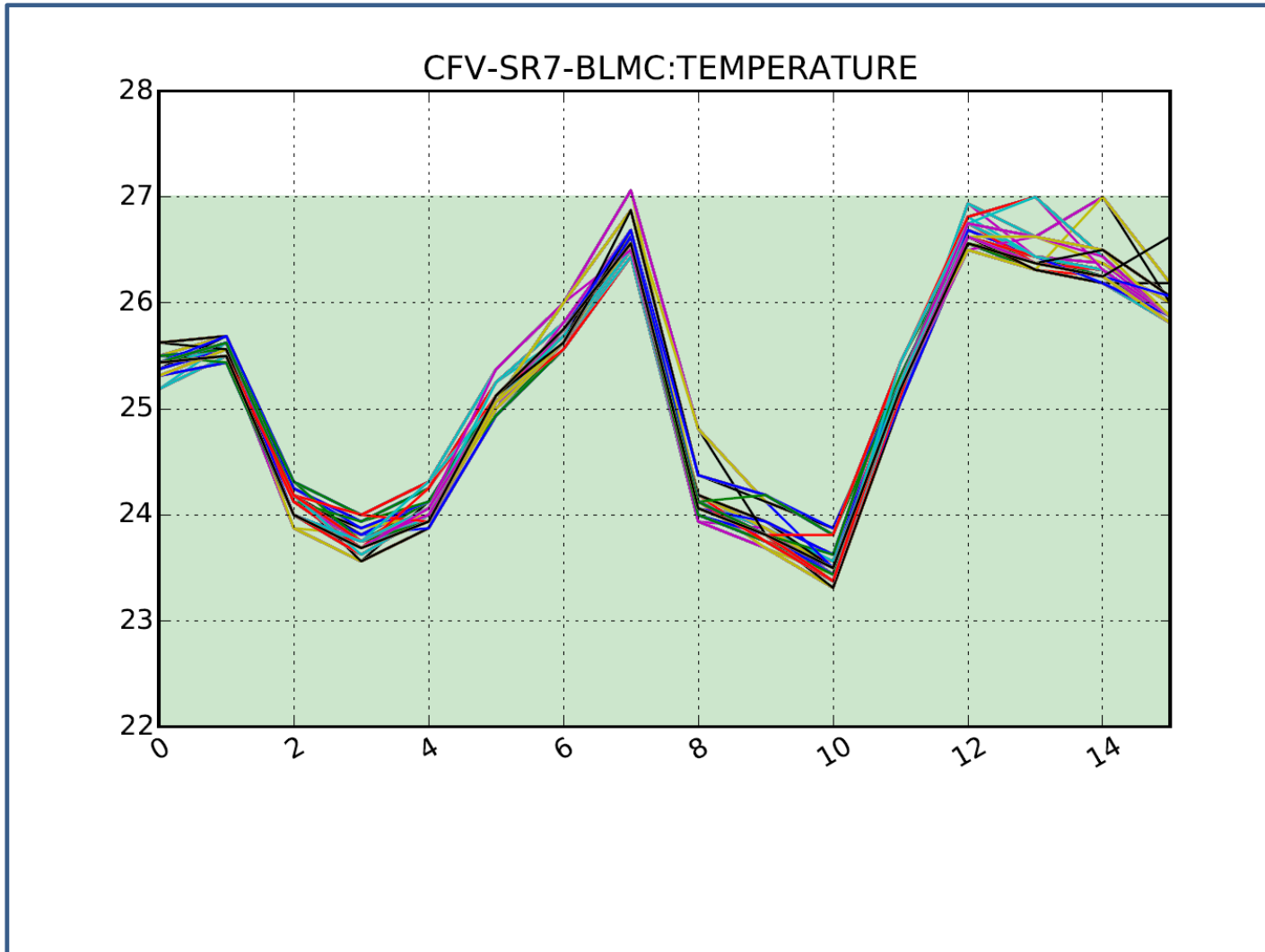
## Extra Plot Type: **VECTOR**

Use Case: Show the evolution in time of BLM card temperature measurements for a given day. Each line corresponds to a DAB. The green band correspond to the limits configured in the alarm sheet.



## Extra Plot Type: **VECT\_TRANSP**

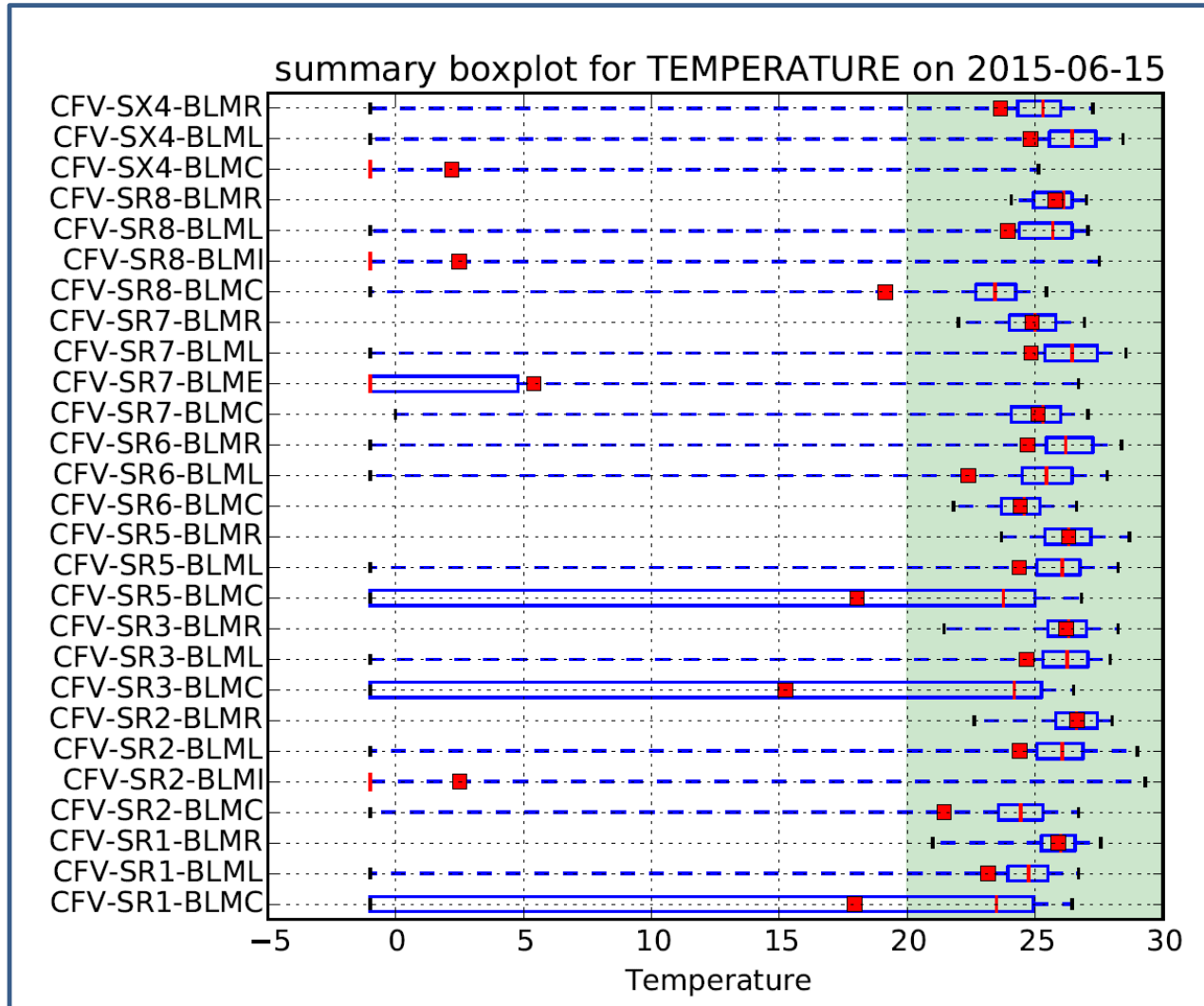
Use Case: Show the BLM card temperature measurements. The green band correspond to the limits configured in the alarm sheet. Abscisse is the card id. Each line corresponds to a DB record. The green band correspond to the limits configured in the alarm sheet.





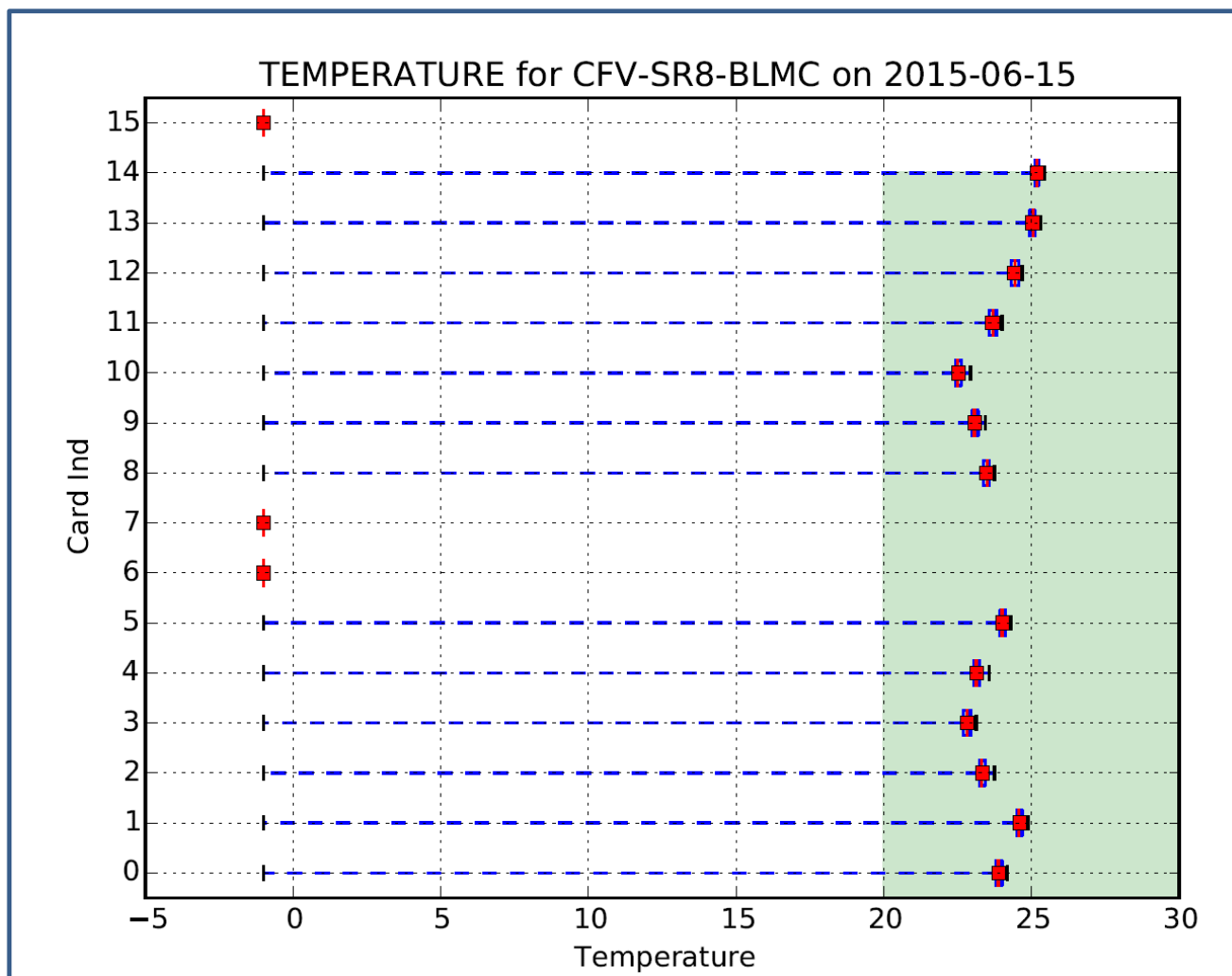
## Extra Plot Type: **SUM\_VECT\_BOX**

Use Case: Gather in one plot statistic for all BLM temperature measurements in all crates for a given day

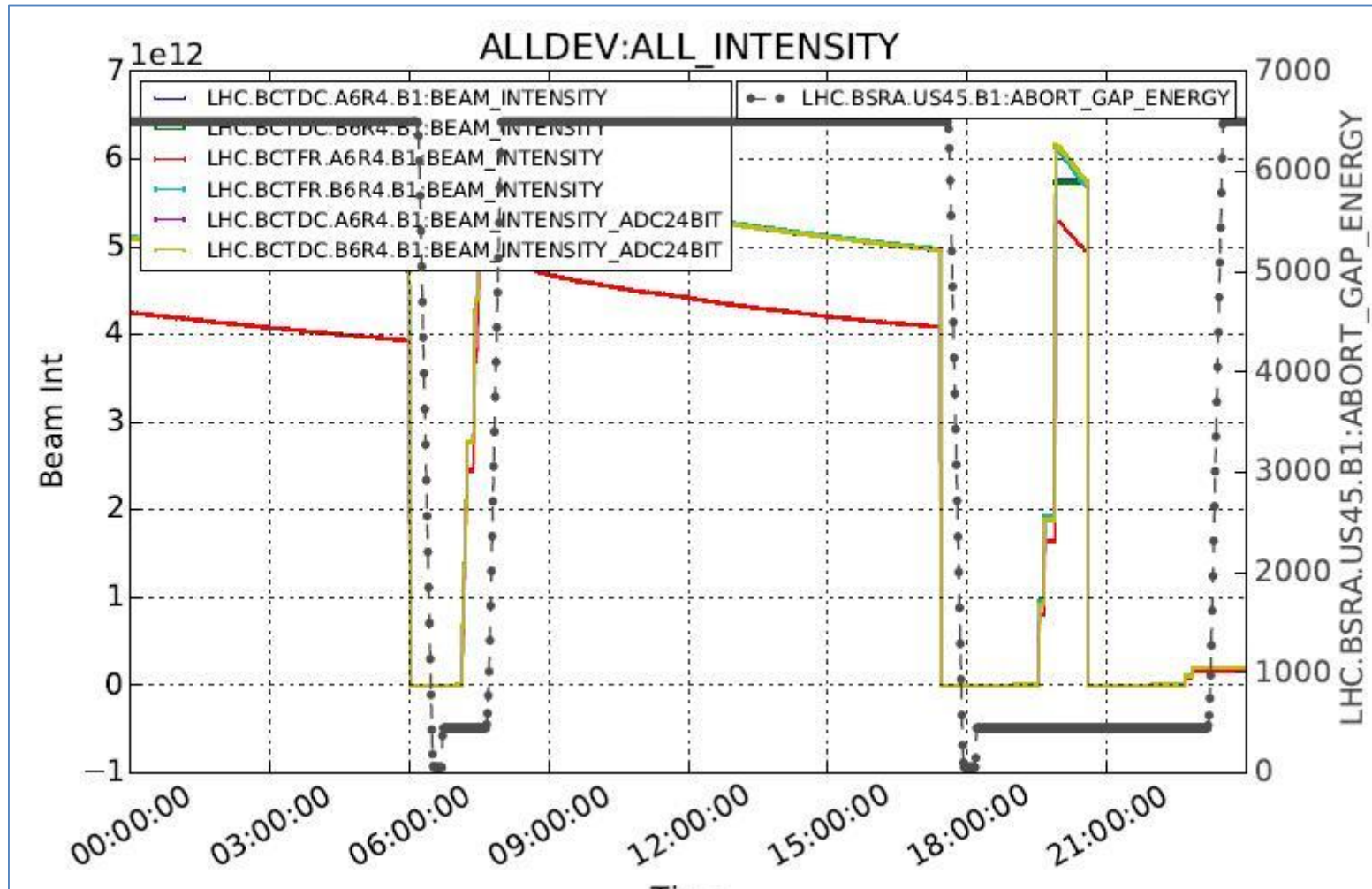


## Extra Plot Type: **VECT\_BOX**

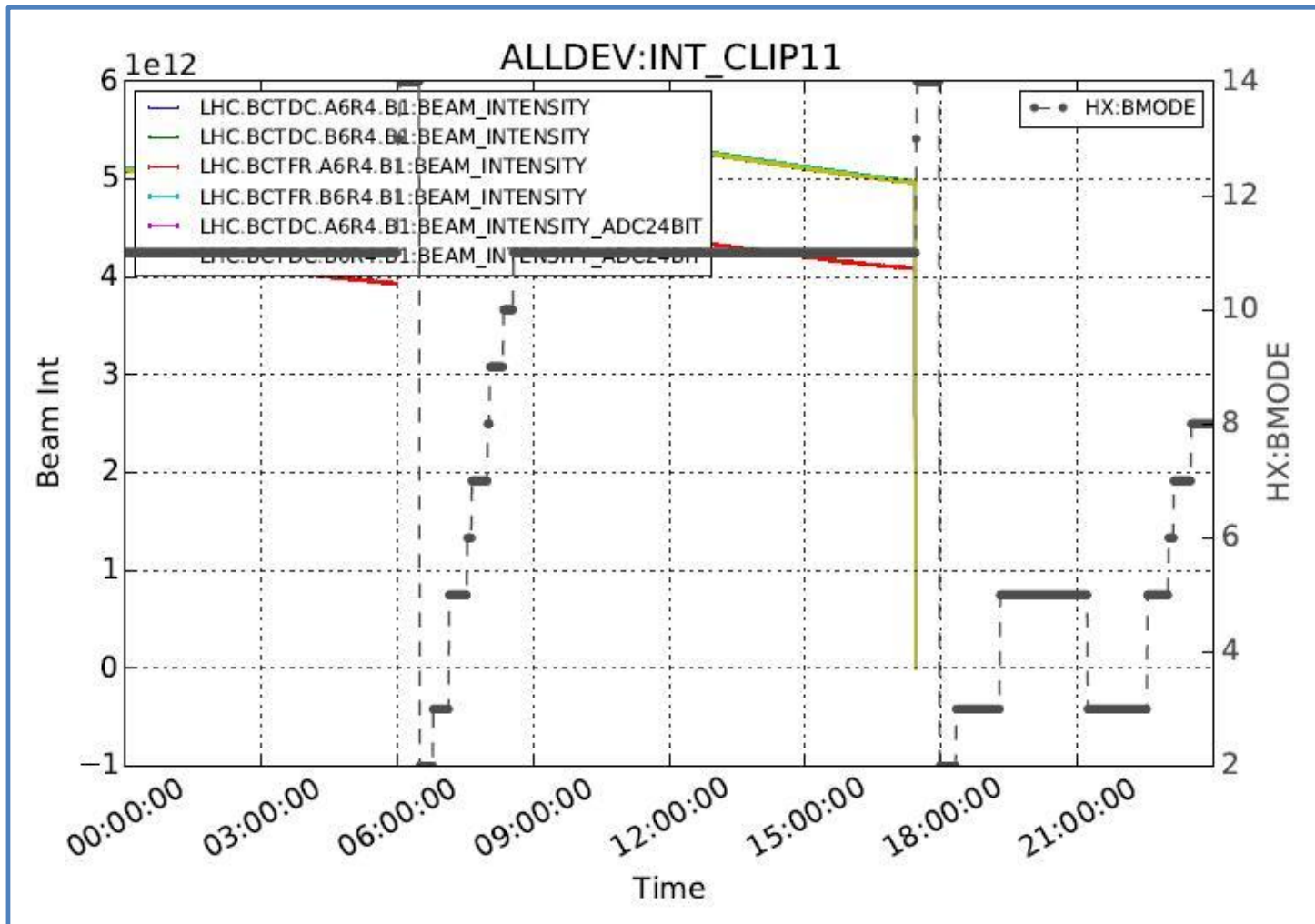
Use Case: Gather in one plot statistic for all BLM temperature measurements in a given crate for a given day



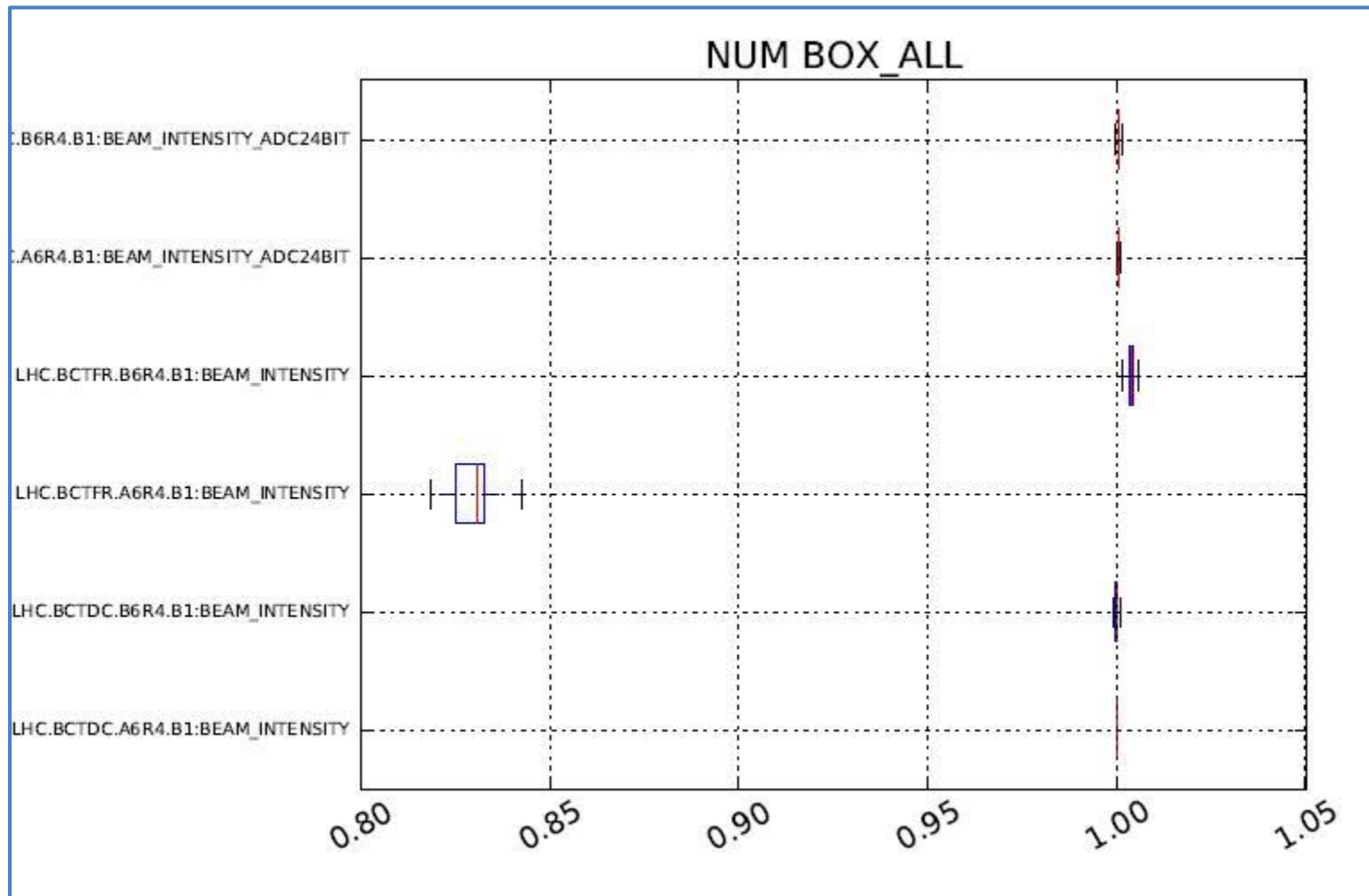
# Use Case: Merging LHC B1 BCT devices and plotting with energy as secondary axis.



# Use Case: same showing filter BCT data where beam mode = 11 (stable beam)

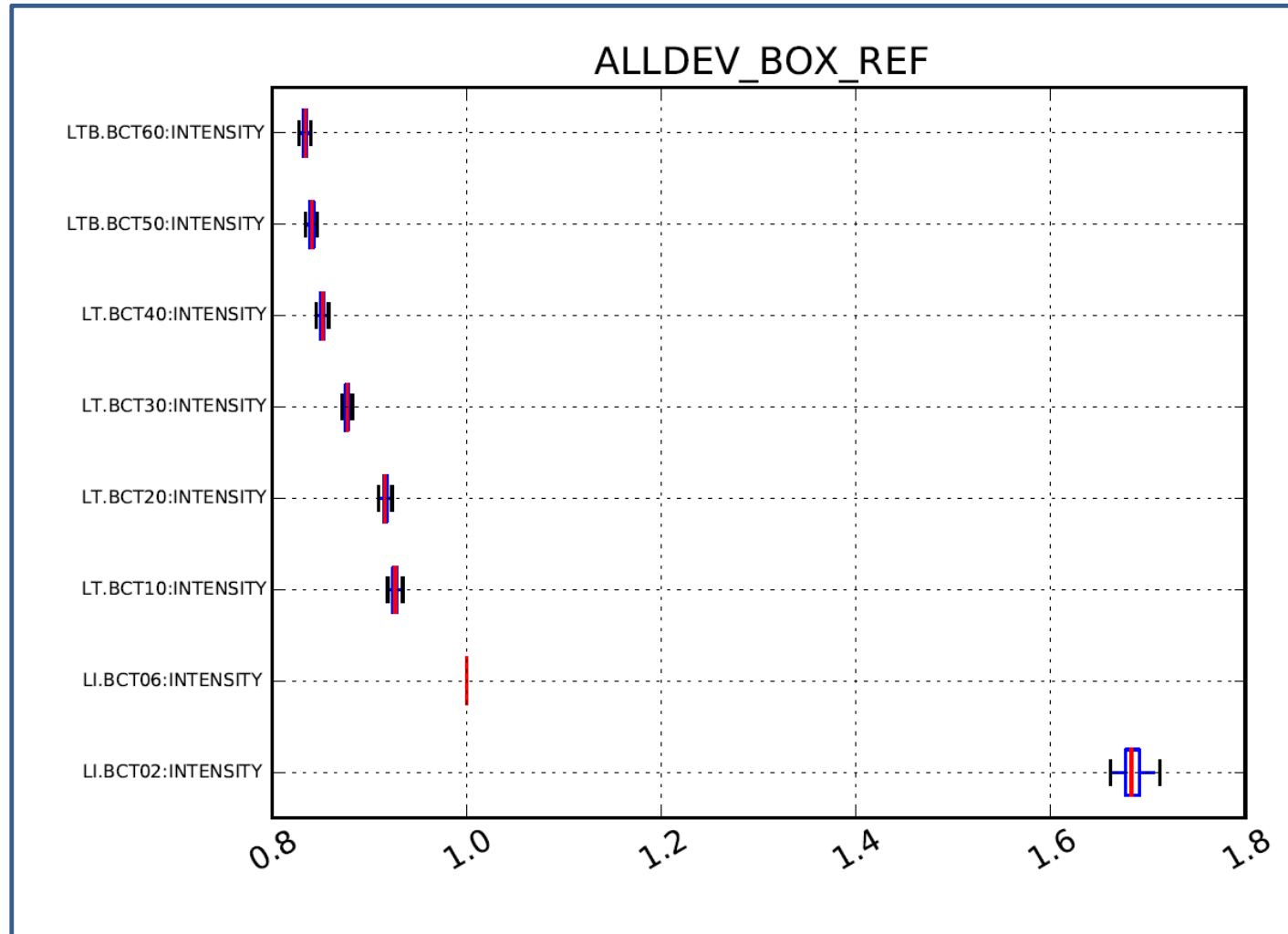


# Use Case: LHC B1 BCT comparison during stable beam mode (wrt DCCT A)



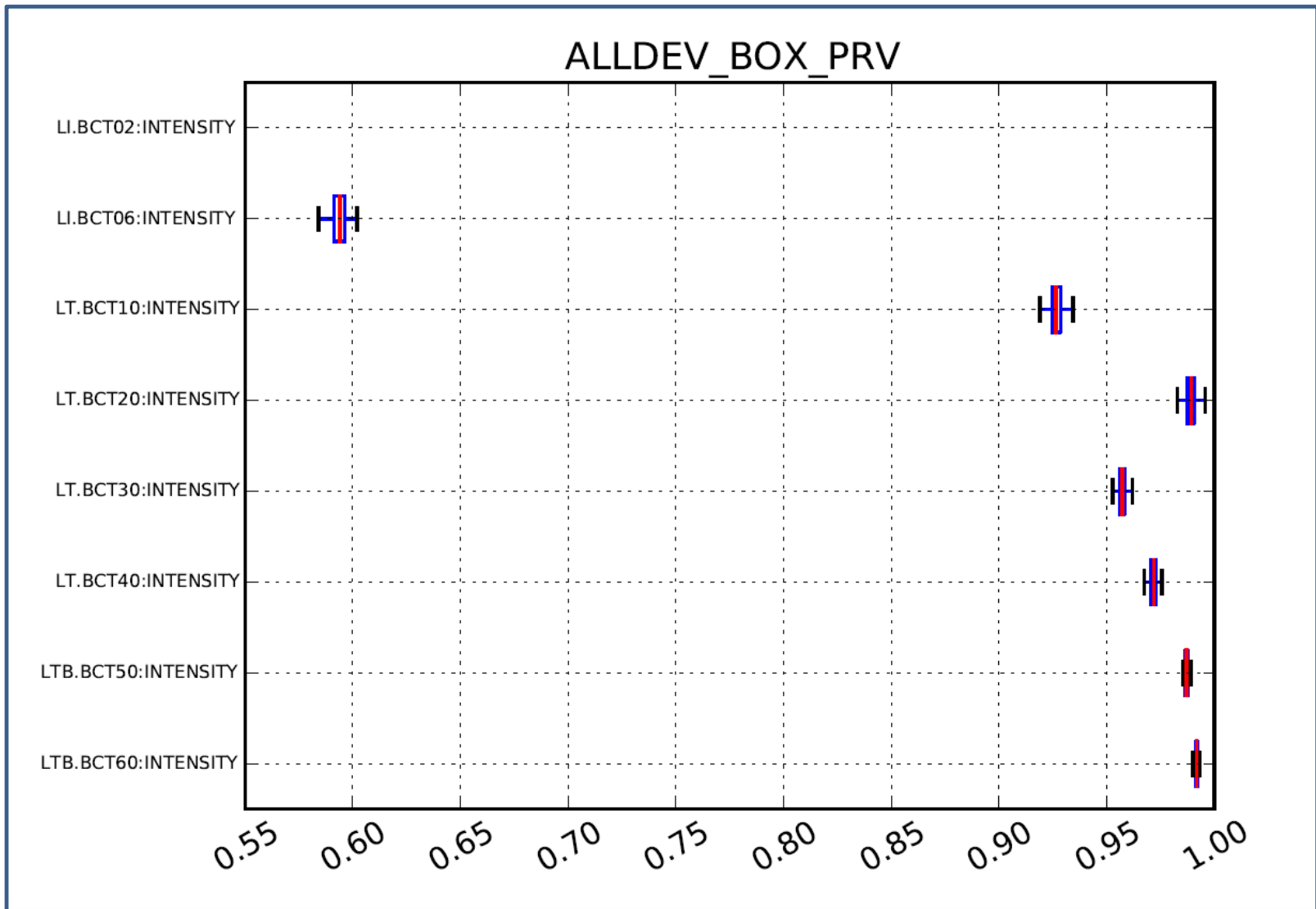
## Extra Calculation: **WRT\_REF**

Use Case: Show Relative measurement statistic (over a day) of BCTs in L2 with respect to LI.BCT06.

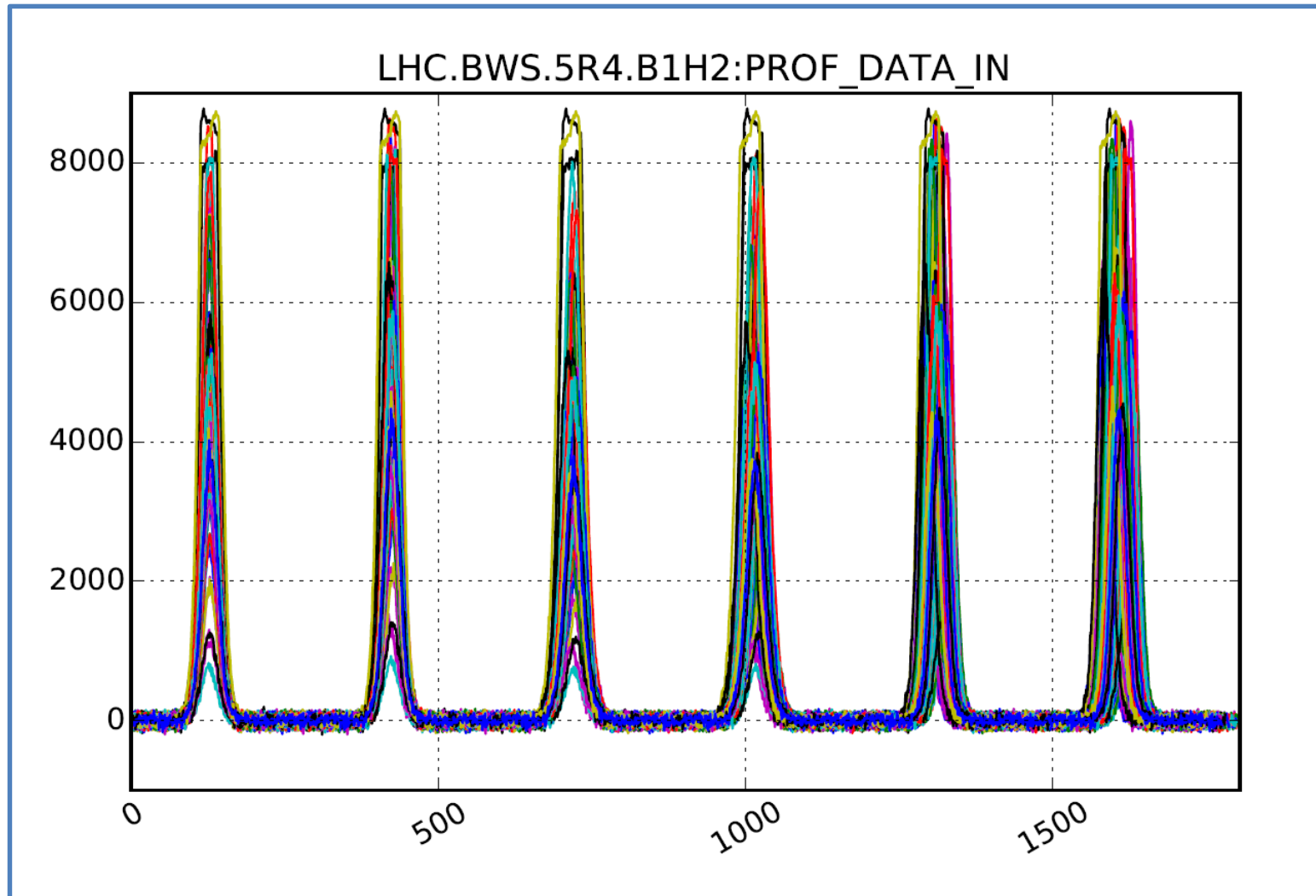


## Extra Calculation: **WRT\_PRV**

Use Case: Show Relative measurement statistic (over a day) of BCTs in L2 with respect to previous BCT on the line.

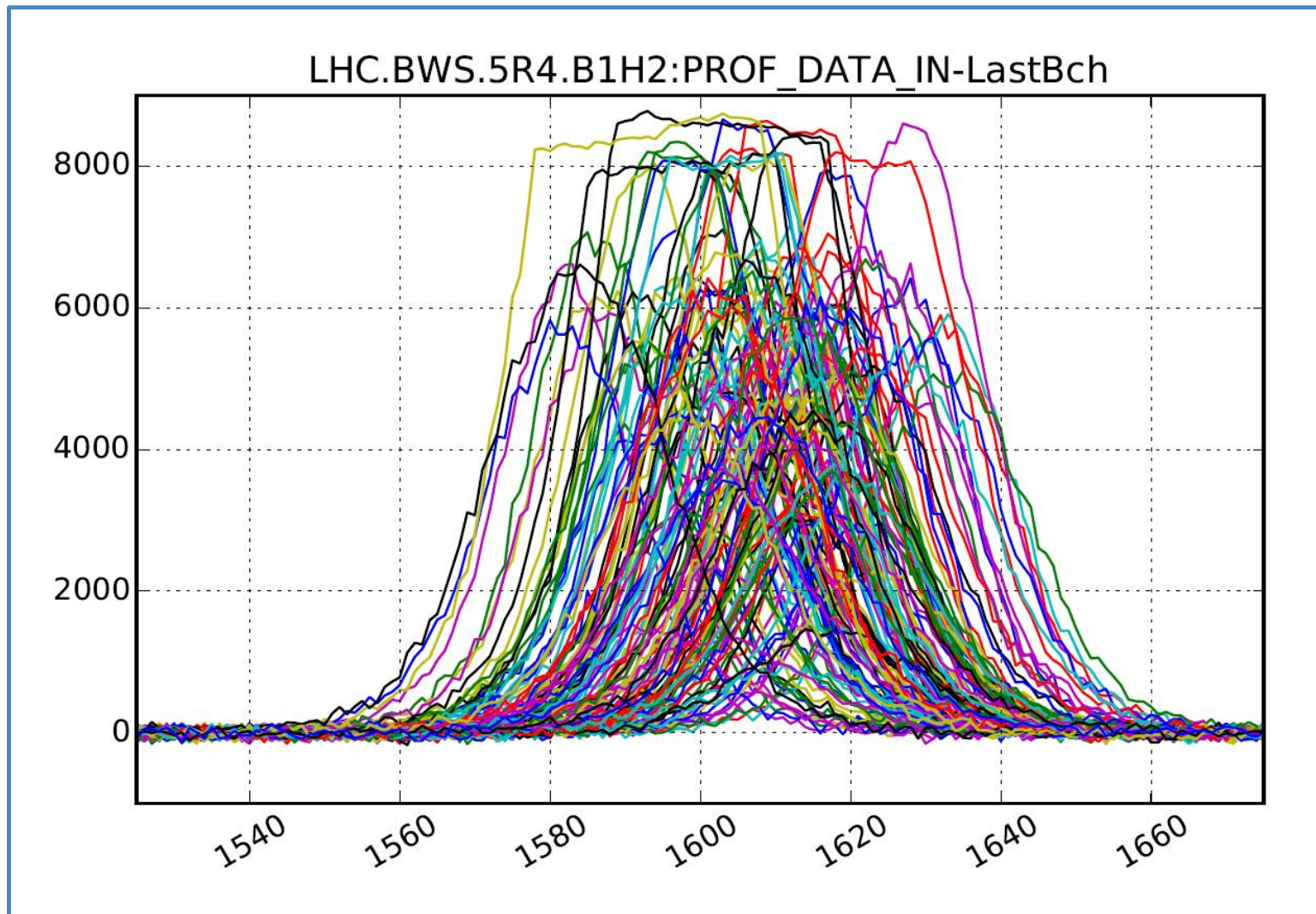


Use case: All scans (PROF\_DATA) during an LHC measurement campaign period with 6 bunches (Using a fixed time window snapshot)

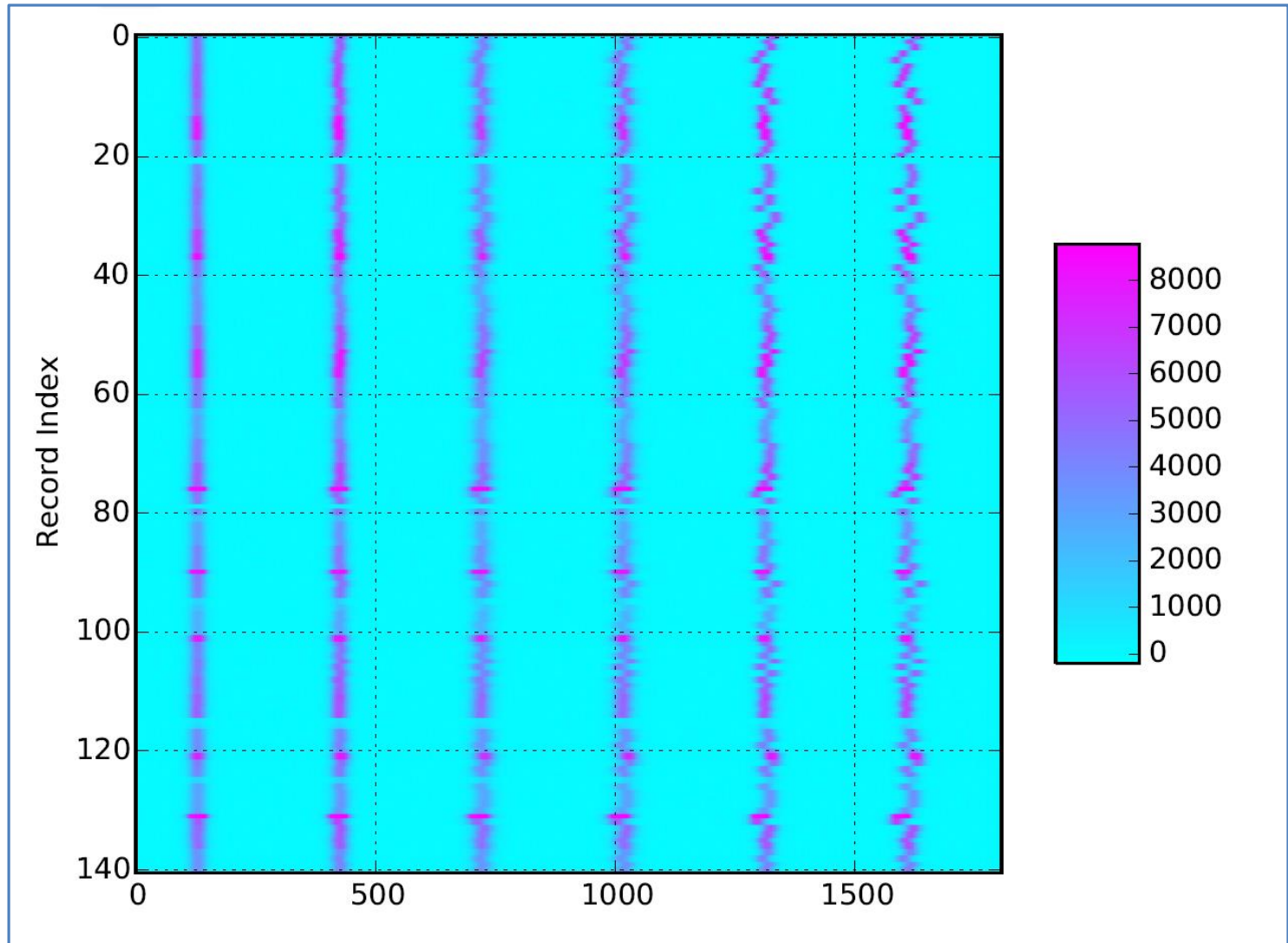




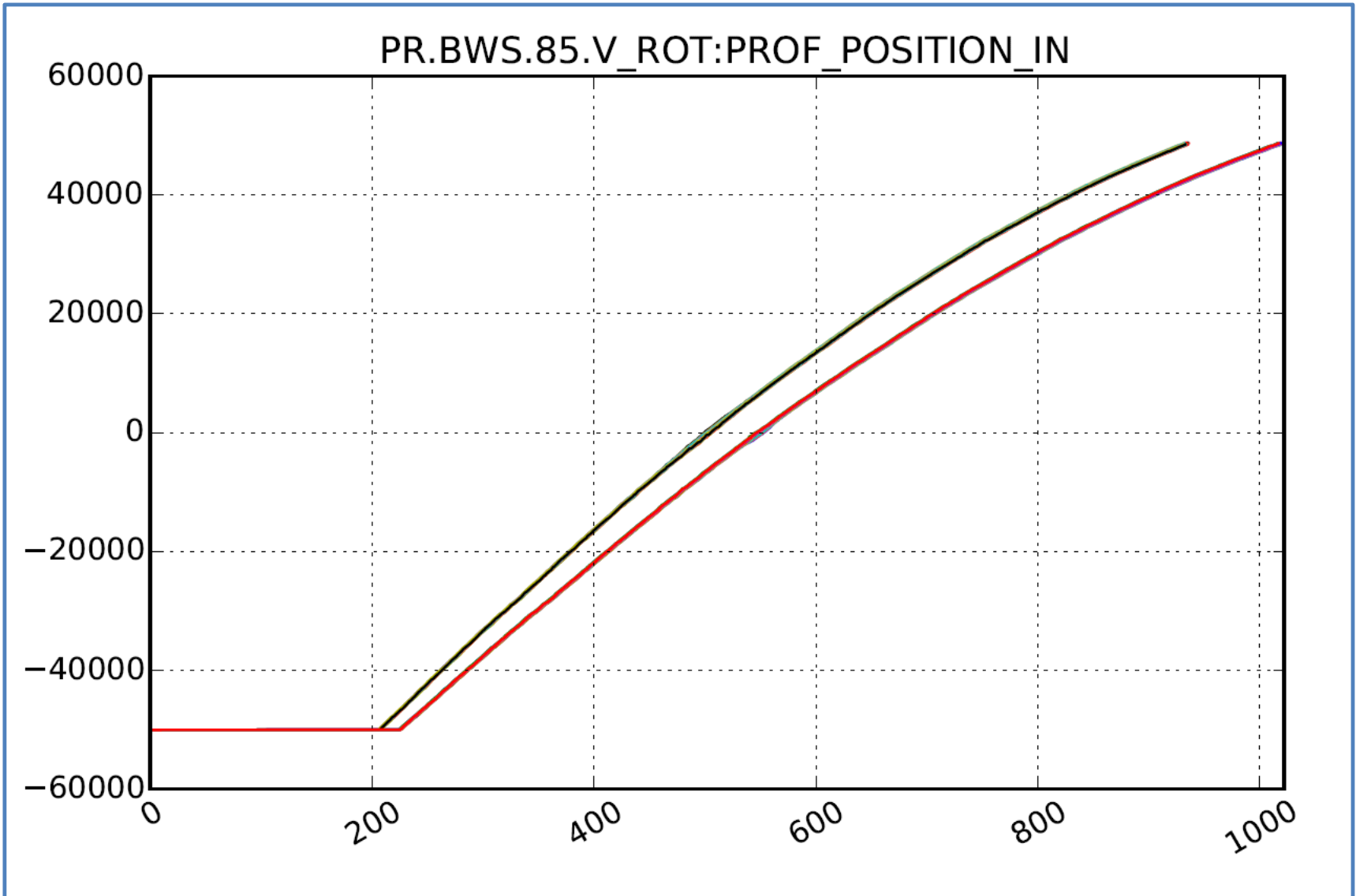
Use case: Same, but zooming on last bunch...



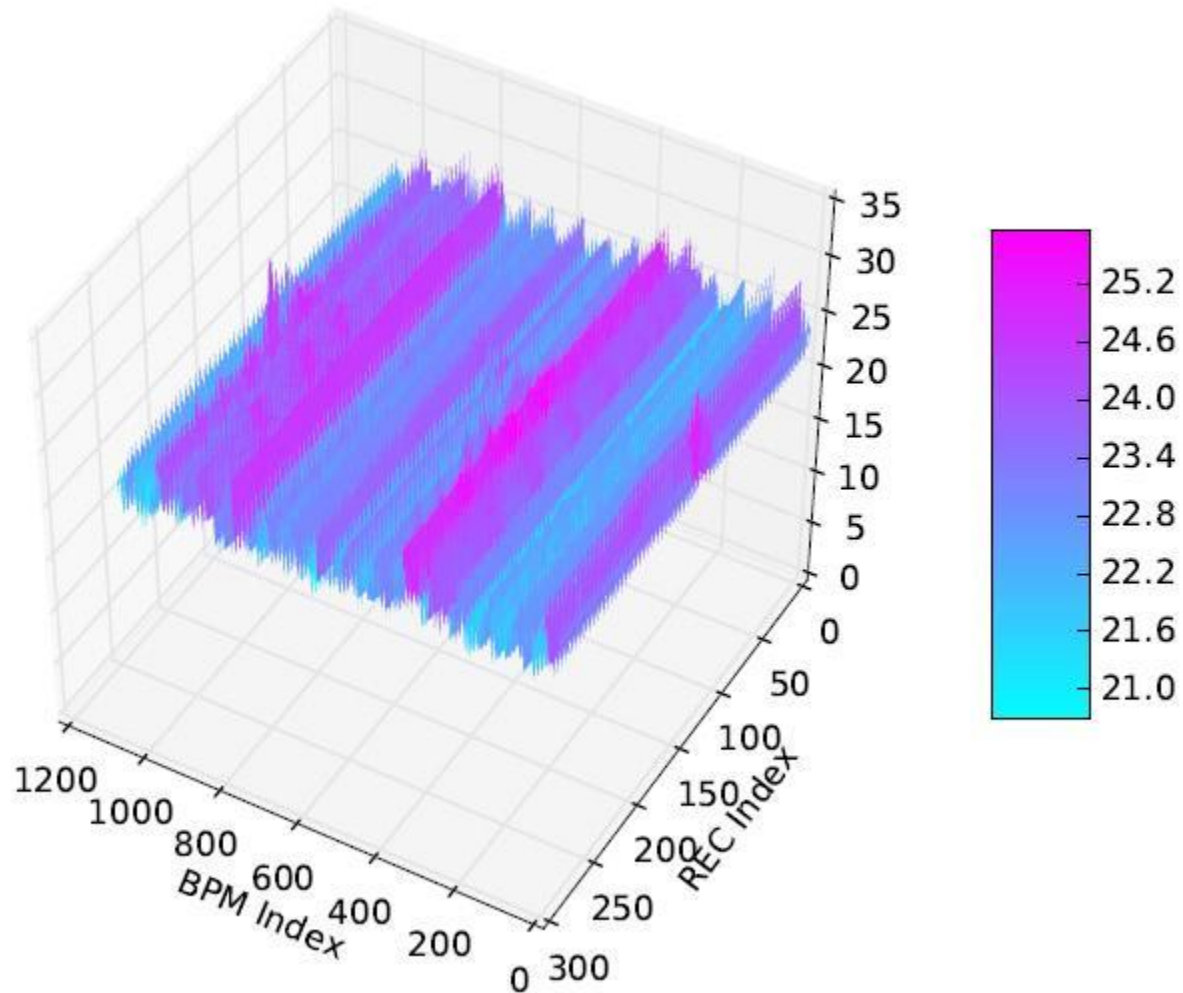
Use case: Same, all bunches but as 2D view...



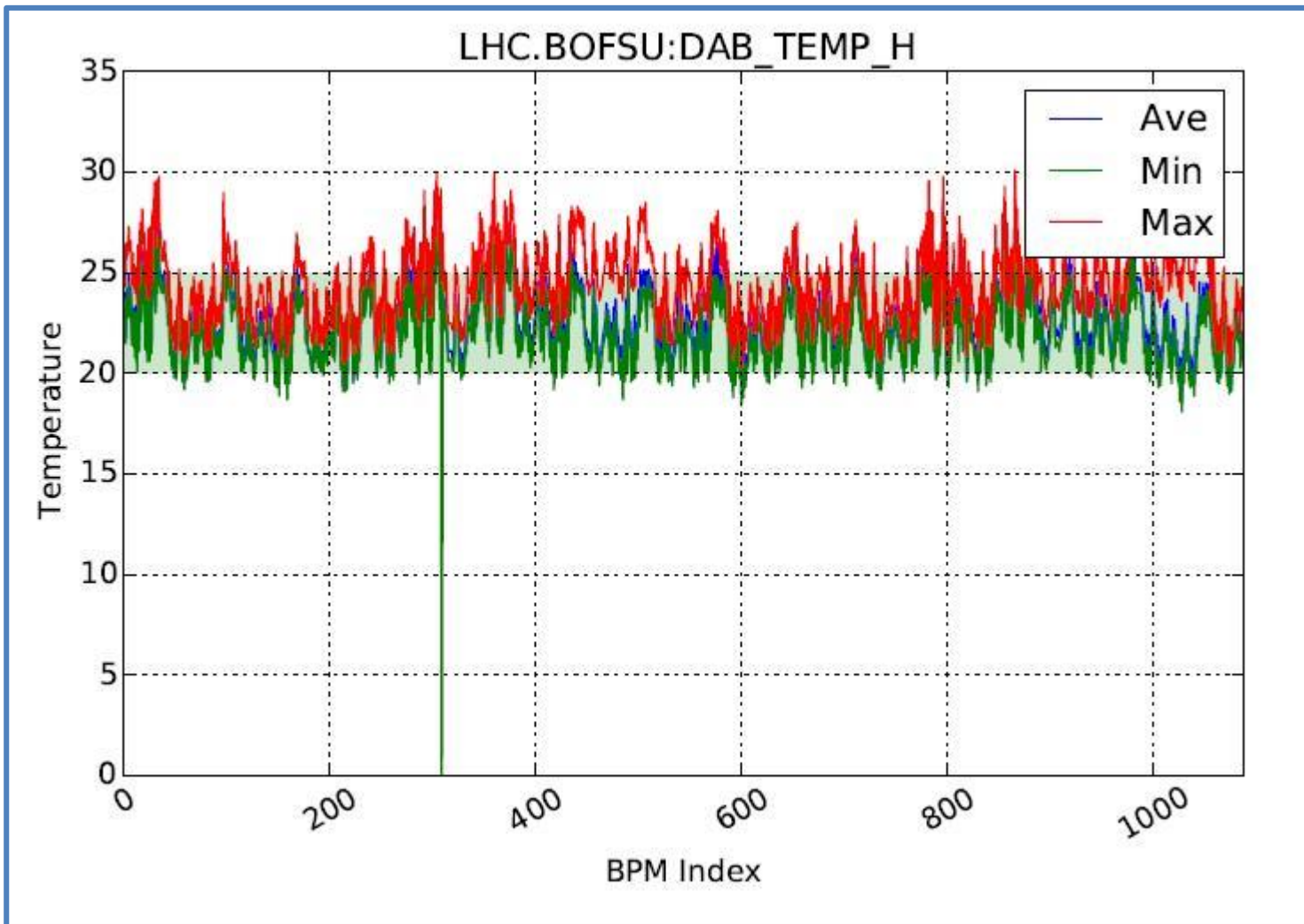
# Use Case: The PROF\_POSITION data for a set of scans



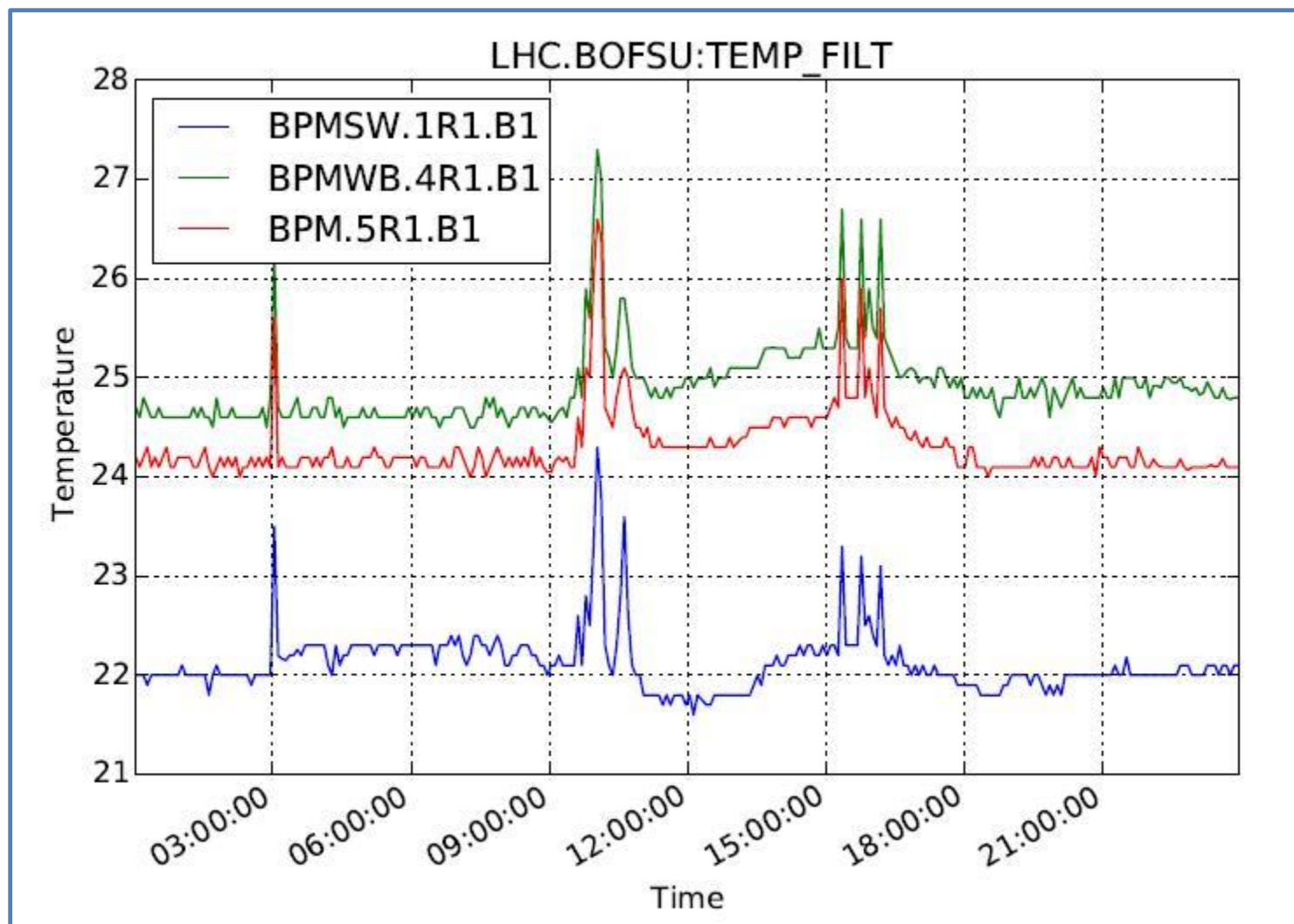
# Use Case: 3D view of BPM DAB temperatures (one day)



# Use Case: Statistics on BPM DAB temperatures (average, min and max for each channel over one day)



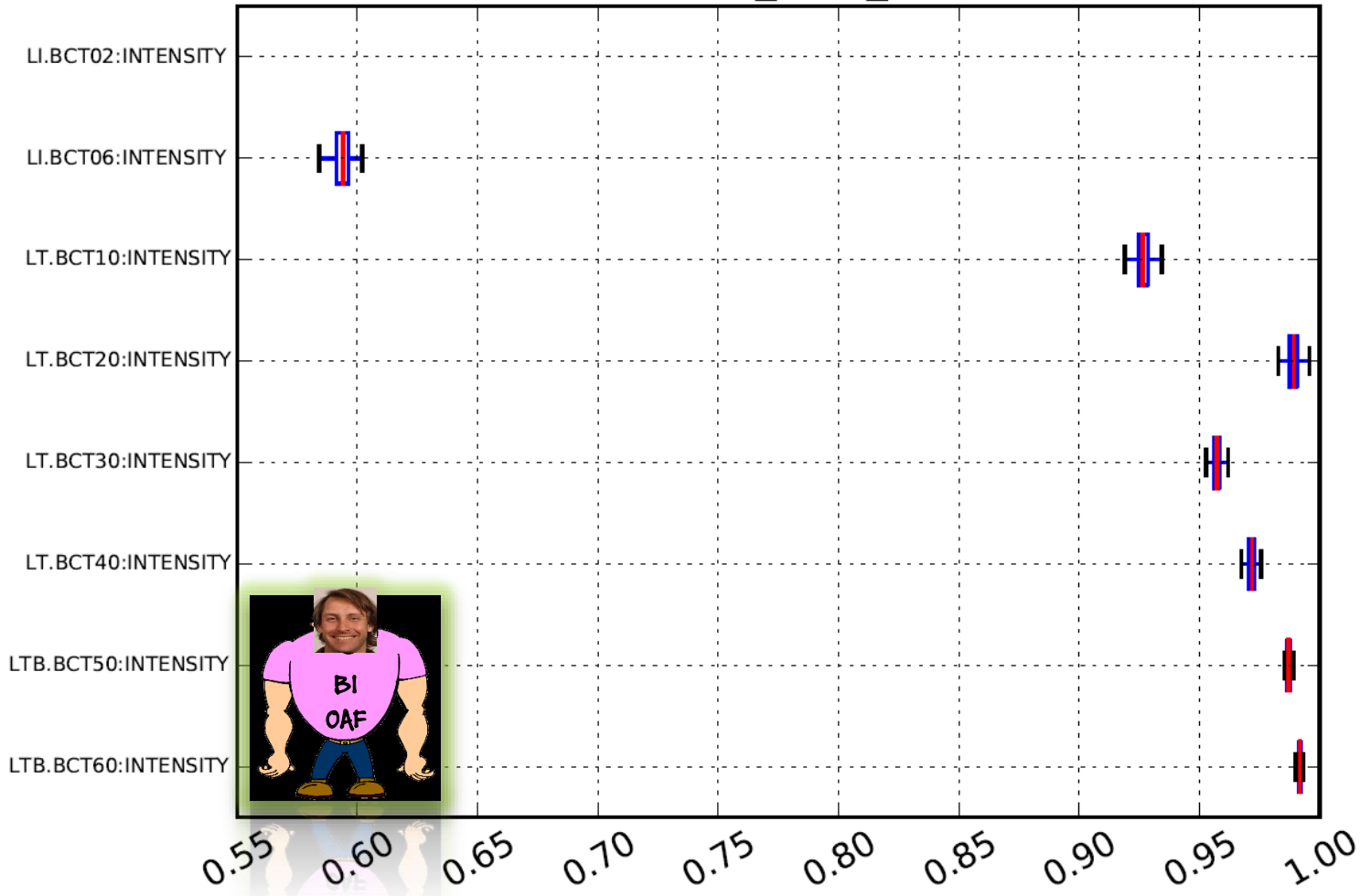
# Use Case: Selection of a few channels over the 1000 BPMs data



...

JJ's proposal for a little logo to remind the source of the plot (and that bad behaviours should never remain unpunished)...

ALLDEV\_BOX\_PRV





# The Next (soon) Steps

- Missing and foreseen features:
  - History features for easy long term monitoring on NUMERICS and VECTORNUMERICS
  - Scatter plots and some correlation options
  - Handling of 2D images (especially with dynamic dimensions)
  - Low resolution reports.
  - When aging/status reports will be properly covered by a stabilized framework, open the door (via a maintainable/efficient solution) to the configurable introduction of dedicated code by <instr/dataset> developed by expert...

# Potential Extra Usage

- We could try also to use this tool 'ONLINE' during MD
  - We could define a short time (ie 15 mn) dynamic DB snapshot to look at the last 15 mn DB recording to check that things are going well
  - We could define before the MD a DB snapshot covering the entire MD time frame and play this snapshot during the MD to already see in realtime the data analysis we prepared before.

# Main Tools:

## Naming Conventions

- In order to make things possible and a little organised, we used (and impose to work with OAF) the following naming conventions.
- Each set of data (not when, only what) will be identified by an **<instrument ID>** and a **<data set ID>**
- <dataSet ID> must not contain the ‘\_’ or ‘ ’ characters
- <instrument ID>. Must belong to a predefined list that the OAF team is maintaining
- The corresponding Timber ‘snapshot’ (see later) must be ‘Public’ and called: **BI\_<instr ID>\_<dataSet ID>**

# Main Tools: Naming Conventions

- So far we 've got:
  - BCT, BLM, BOFSU, BPM, BSRT, BWS as instrument IDs
  - And the following Timber snapshots for example:
    - BI\_**BCT**\_calib
    - BI\_**BCT**\_B1-cmp
    - BI\_**BLM**\_LHC-temp
    - BI\_**BWS**\_PSB-H-status
    - ...

# Main Tools:

## Report Repository

- Mail sent will contain in addition to a summary of the alarm report:
  - A link towards the new report
  - A link towards the repository where all reports are stored ([http://bewww/~bdisoft/bi\\_report/](http://bewww/~bdisoft/bi_report/))
  - A link towards the repository where most recent reports are referred ([http://bewww/~bdisoft/bi\\_report/RECENT/](http://bewww/~bdisoft/bi_report/RECENT/))
  - A link towards the repository where most recent reports with alarms are referred ([http://bewww/~bdisoft/bi\\_report/RECENT WITH ALM/](http://bewww/~bdisoft/bi_report/RECENT_WITH_ALM/))
  - A link towards the repository where most recent reports without alarms are referred ([http://bewww/~bdisoft/bi\\_report/RECENT WITHOUT ALM/](http://bewww/~bdisoft/bi_report/RECENT_WITHOUT_ALM/))