

### Crate problems:

- Last month we noticed SPECS network problems on Mercury crate:

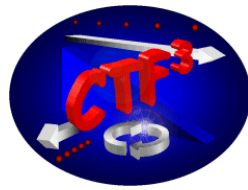
3 last boards KO/4.

Tests showed a daisy chain transmission problem (swapping boards and timing measurements).

We still have to investigate why problems occur on a crate which used to work:

- EMC problems: we recovered the 2<sup>nd</sup> board just connecting grounds.
- occurred when current increased: radiations? Though rad-hard design.
- Next shutdown several actions: cable length adaptation for timings, grounding...
- LAL team developers of SPECS are interested to investigate the problems. They should come when accelerator will be open.

Currently, in Mercury 2 boards OK, 2 KO. Also 1 KO in Uranus.



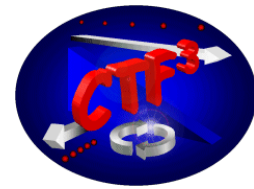
### Crate problems:

- Finally, a solution could be to increase the number of network links and reduce the number of boards chained to 2: next shutdown, several network cables will be installed.

Mercury crate problem showed that a transmission breakdown can occur even it used to work for a long time.

At the end it should represent an additional cost of 1 gateway + 3 SPECS master boards + cabling: cost of peace?

Also a solution to run different timings on TBTS crates because of PCI conflicts (FESA crashes).



### **1st part installation: end April.**

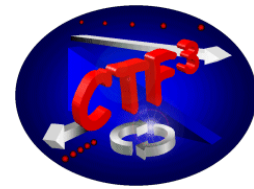
1 crate "Titan": 2 DFE boards + timings distribution + cabling AFE-DFE.

### **2nd part installation: W39 - W42.**

3 crates ,12-13 DFE boards + timings distributions + cabling AFE-DFE.  
All boards ready, waiting for CLEX opening to produce AFE-DFE cables (lengths).  
Installation and tests foreseen the two last weeks.

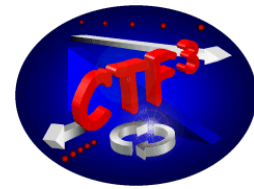
### **Other.**

- collaboration with Franck G. for a calibration mux. soft (Jean Jacquemier).
- modifications on 5 TBTS analog modules foreseen next shutdown to have both analog and digital readout.
- Acquisition documentation available on: <http://hal.in2p3.fr/in2p3-00412457/fr/>



### *first tested prototypes:*

- ADC evaluation board with both samplings (100Msps & 500Msps). Tests and debug this summer: 100Msps 16bits solution works well. (ENOB $\approx$ 12,5).  
500Msps ADC does not work very well and ENOB=10bits (prototype).
- Tests on PCI optical transmission boards have shown the feasibility of synchronous data and machine clock transmission on a standard fiber and its repetition. Elimination of timing cables and timings boards possible.
- Design and tests of a local 10A/50 $\Omega$  calibration current pulse generator proto. 3% Current regulated and good square shape. Rise time $\approx$ some ns. Current should be locally regulated by the FPGA.



### ***Architecture simplification:***

At the beginning we foresaw a 6 ADC boards (4channels each) crate dedicated to the CLIC module:

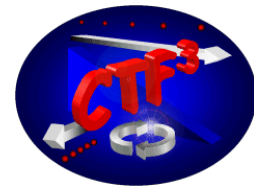
***Crate:*** 6 ADC boards + 1distribution/repetition board + 1 local service board (power supplies and calibrations).  
+ 1 PCI board for network (gateway).

After discussions with CLIC collaboration, the needs for one module and typical use in CTF3 allow to limit the acquisition to 4 BPMs by crate.

We think we can integrate these 16 channels on one single board: no more local network switch.

→ very important cost reduction: no local switch, only one PCB and FPGA, simpler network...

Currently, we study the performances of such an acquisition chain: estimation of possible dynamics, elimination of analog preamplification, local FPGA processing, network compatibility with future synchronous ethernet White Rabbit...



### Next actions:

Technical discussions and specifications definition are foreseen with CLIC after the shutdown. As the future pick-ups are not well defined, the idea is to make a proposal with a “state of the art” technology for a low cost 100MSPs solution.

We will propose to produce a prototype of the full chain: mid 2010.

- small crate with 1 ADC board (4\*4 channels) + 1 local service board.
- PCI express optical network board (network distribution).

Could be tested in CTF3.

Collaboration should be formalized.