

BT2017 Preparation

- Status of the slabs
- Cosmics with several slabs

A. Irles, LAL, 6th May 2017



■ 10 slabs (from 13-22)

■ <https://owncloud.lal.in2p3.fr/public.php?service=files&t=57ca5700e08beb530dc8731c6ba6cdc8>

■ 13,14,15 → not ready for BT

- 13 is not well tested (first one into the commissioning procedure... I have strong suspects that is not a bad slab)
- 14 → DataIntegrity checks give always very bad results (only 0-2% of spills are okay)
- 15 → several chips missing, not cosmics → before was okay.

■ **7 GOOD SLABS:** 16,17,18,19,20,21,22

- Good uniformity (MIP ~55 ADC, thresholds around 225-240 DAC)
- All are well shielded (kapton protecting the aluminum plates) → It is very easy to scratch **ATTENTION!!**
- All slabs are grounded in the bottom (aluminum plate at the end of the slab) except 19... why ?
- All slabs have correct VDDA, VDDD, but 19, 20, 21 have VDDA = 3.3 V (instead of 3.5 V) why ?
- Masked channels between 6-20% (conservative procedure)

■ Optimization of the slow controls: **compensation capacitance**

- the **compensation capacitance** should prevent overshoot and ripple at the output of the preamplifier. According to the value one may trig (or not) on the primary pulse or an overshoot.
- Default 4pF. Tested 1pF and 6pF. With 1pF we lost a full slab (16)
- Final chose **6pF** → need to redo the optimization of the hold value.

■ Optimization of the slow controls: **feedback capacitance =1.2pF (high Gain)**

■ Find Noisy channels → Find Noisy algorithm

■ Find those channels manually:

- all chips: channel 37
- chip 2, 10 --> channels 41-47
- I disabled the preamps, not only the trigger output.

■ Then the Find Noisy works fine,

but it also shows some systematical findings

- chip 1, 9 --> channel 5
- chip 2, 10 --> channels 48-53
- chip 8, 16 --> channels 3, 9

■ Conservative approach: mask 50 channels before FindNoisy.

■ Even more conservative: mask triggers and disable preamps (for ADC=4 and noisy channels)

■ All these conclusions were extracted before finding the BCID 2050 problem:

- which is related to a grounding issue
- which can introduce noise in the channels
- which can have an effect on the ADC=4 issue

■ Single slab commissioning have been done in the most conservative way.

- Quick less conservative tests done last week → very similar cosmic spectrum.

■ I propose to prepare the next cosmic run in a less conservative way

- Standard FindNoisy (without masking specific channels by default)
- Scurves + thresholds definition
- Check cosmics (long spills) for one hour.

■ If everything runs okay → long run.

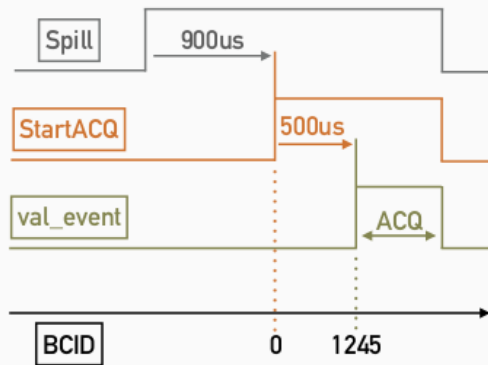
■ If not → get back to the conservative settings (~ 1 extra hour)



SK2/2A timing

With the current setup: spill length \neq acquisition length:

1. Spill starts the acquisition window: reset and power ON
 2. $900 \mu\text{s}$ delay for power to stabilize
 3. StartACQ starts the acquisition and BCID counter
- but triggers are only accepted within the "val_event" window, which is delayed by $500 \mu\text{s}$ to avoid triggers induced by StartACQ



Real acquisition length: spill length $- 1.4 \mu\text{s}$!



Artur Lobanov | LLR - École Polytechnique | CALICE Meeting, 22.03.17 | Page 5 *LLR*

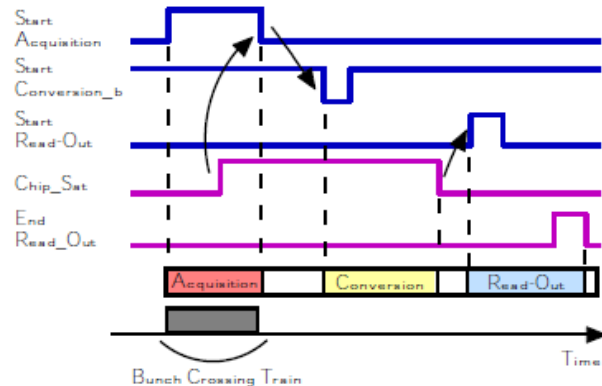


Figure 6: Global sequencing with chip full during acquisition

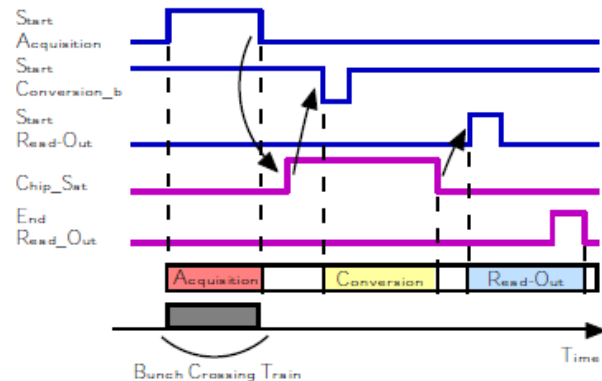


Figure 7: Global sequencing with chip not full during acquisition