DT Commissioning at SX5

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Commissioning crew

- Aachen: Sowa, Hoepfner
- Bologna: Cavallo, Rovelli, Siroli, Giunta, Marcellini, Travaglini
- Madrid: Fernandez, Puerta
- Padova: Conti, Gonella, Parenti, Zanetti, Zotto, Torassa
- Torino: Cerminara, Mariotti

From now on, 2 people on shift should be guaranteed

Commissioning status

- Data taking and MC tests completed for YB+2 (40 DT chambers) during 1st week September.
- (almost) All time-boxes, occupancies and diagnostic results available on commissioning web page:
  - http://cms.pd.infn.it/commissioning/Results
- Waiting for ancillary work on YB+1 (to be completed this week) to start commissioning sector 10 (Cosmic Challenge)
- YB+1 scheduled to be completed by end of November

Commissioning procedure

- Minicrate test
  - ✓ Boundary scan, configuration (TRBs, TDCs, FEs, etc.) checks, TDC channels x-talk, TRB emulator and TRB TestPulses.
  - ✓ Everything is redone in case of intervention on the MC.
- Data taking
  - ✓ Test Pulse run (320 kEvents). T0s computation
  - ✓ 3 trigger configurations for normal cosmic runs: default (1M, for sake of completeness), HanyTheta (1M, standard configuration for data analysis/diagnostic), and HH+HL (100k, to check if the correlation works properly for every TRB).
  - ✓ Compute tTrig, run the analysis and the diagnostic (not always done..)

Rate is increased in the last period (peak of 9 chambers per week), due to reduction of number of runs and improved experience of the commissioners.

Hardware problems

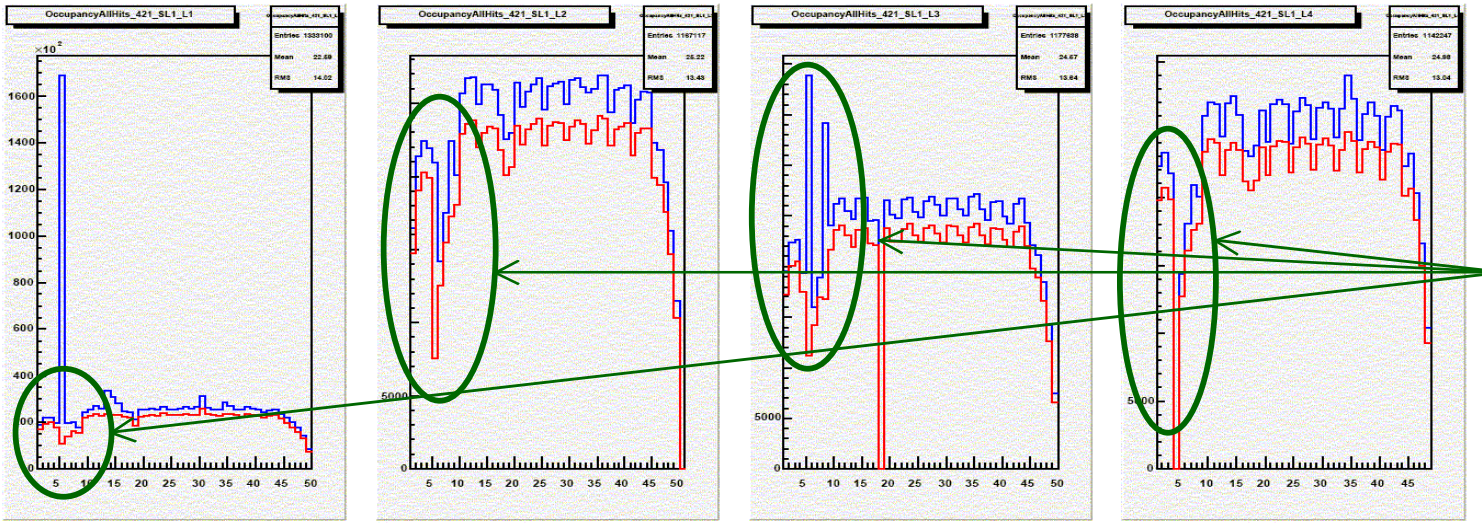
Found during chamber commissioning and fixed by Franco Gonella (actions list since July)

- mb2 sect8. faults in communications: optic link board substitued
- mb1 sect4. many noisy channels on L1 SLTheta: fixed by disconnecting the slow control cable shield from the splitter board ground
- mb2 sect5. Pletora of problems with TRB 0/2 and Server Board: TRBs, SB and connector substituted.
- mb2 sect5. Problems in TDC data comunication: rj45 connection board substituted
- mb1 sect5. clock connector broken: substituted link board
- mb1 sect2. signal connector on MC unplugged: fixed.
- mb1 sect2. 485 veto link converter board missing: added
- mb4 sect2. Correlation between phi1 and phi2 on TRB0 not working (not seen with MC test). TRB substituted
- mb3 sect2. MC unable to be turned on due to missing crimping on LV box: fixed
- mb3 sect3. Unalbe to configure BTI on TRB3. TRB substituted
- mb4 sect8. Wrong setting of threshold on SLPhi2. CCB substituted

Noise in channels (very often) cured by magic re-routing around the MC of signal cables..

Remarks: On-line analysis

- The commissioner on shift has as goal just to successfully acquire the data (by itself implying a steep learning curve..)
- No analysis "in situ" is done on the cosmic data (very often the analysis/plotter programs are not even launched..)
- Some problems could be fixed immediately:

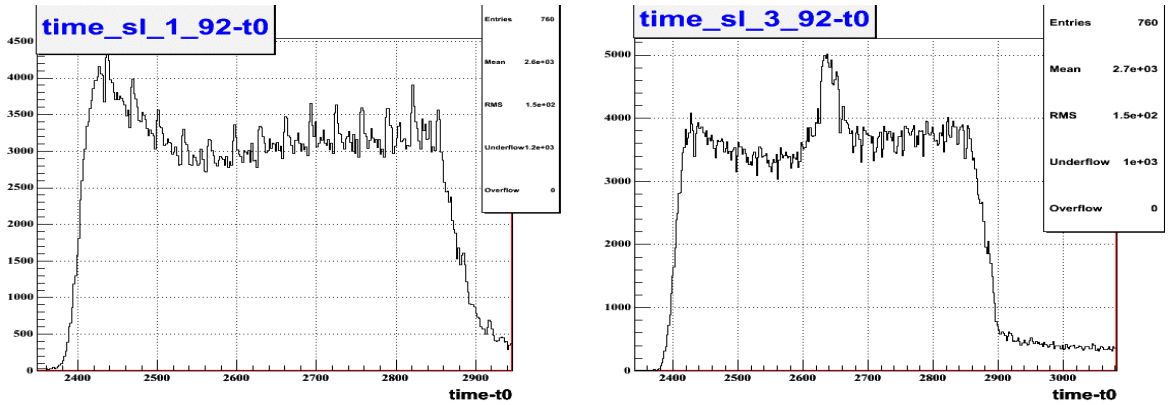


- Critical check of trigger rate, TP, occupancy, timeboxes and diagnostic is needed

In general, "interactivity" can save a lot of time

Remarks: Off-line analysis

- Many peculiar effects seen so far…



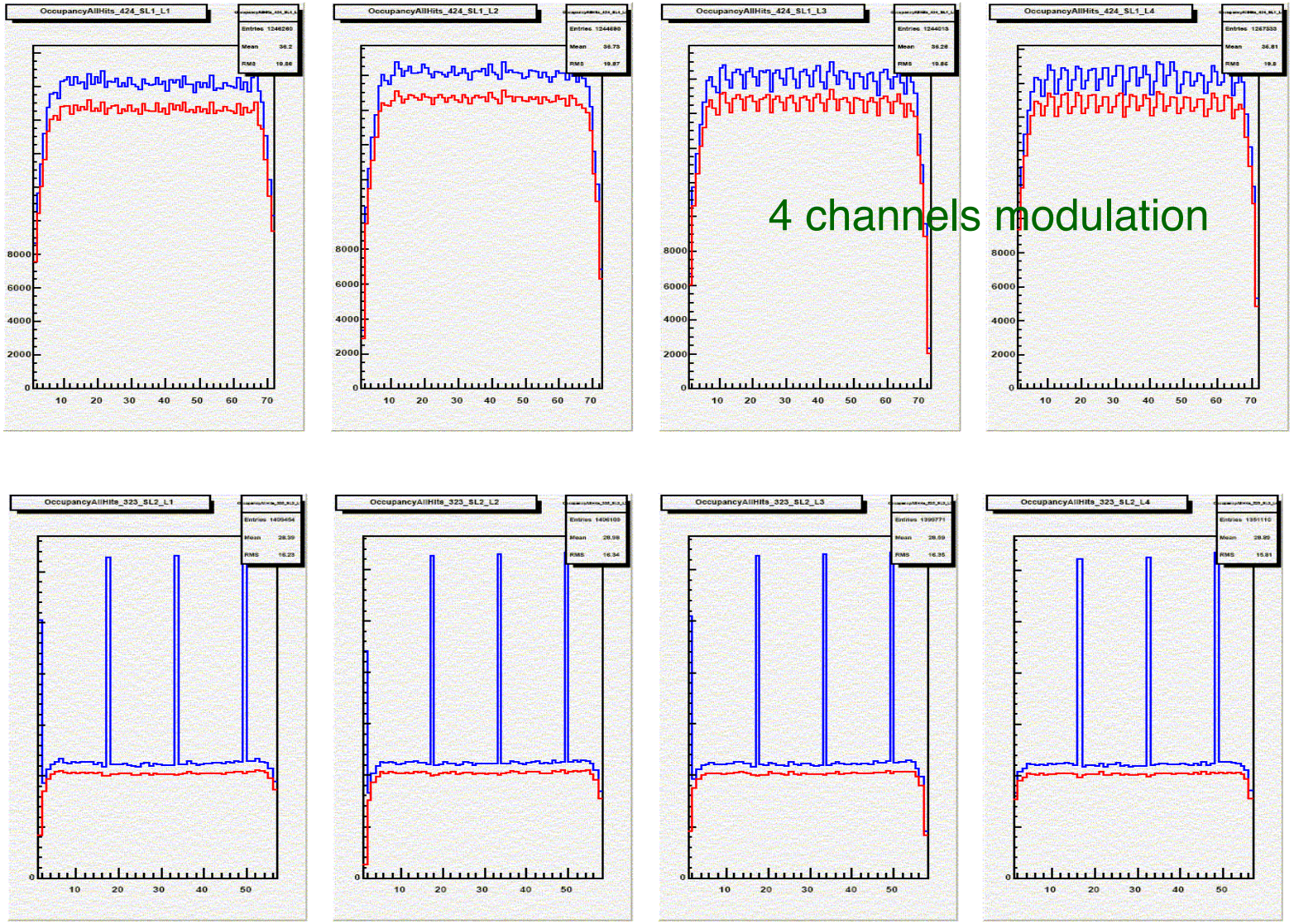
- Most of the people busy in trying to understand them
- Enrico has been summarizing diagnostic results, but
- A complete overall analysis is missing:

  ✓ per chamber. All effects difficult to explain online. Support future online checks

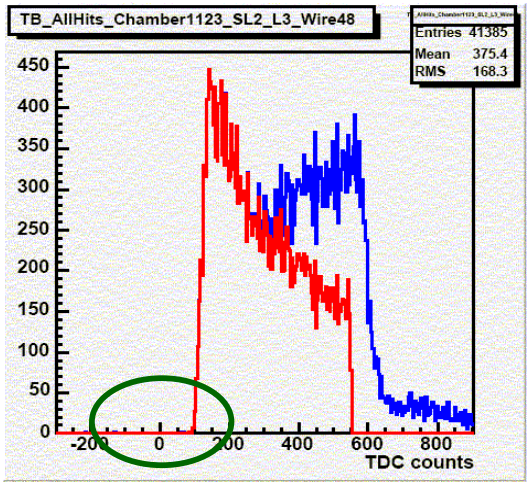
  ✓ inter-chambers. Comparison of trigger rates, occupancies and time-box shapes, resolutions, efficiencies, thresholds and noise levels

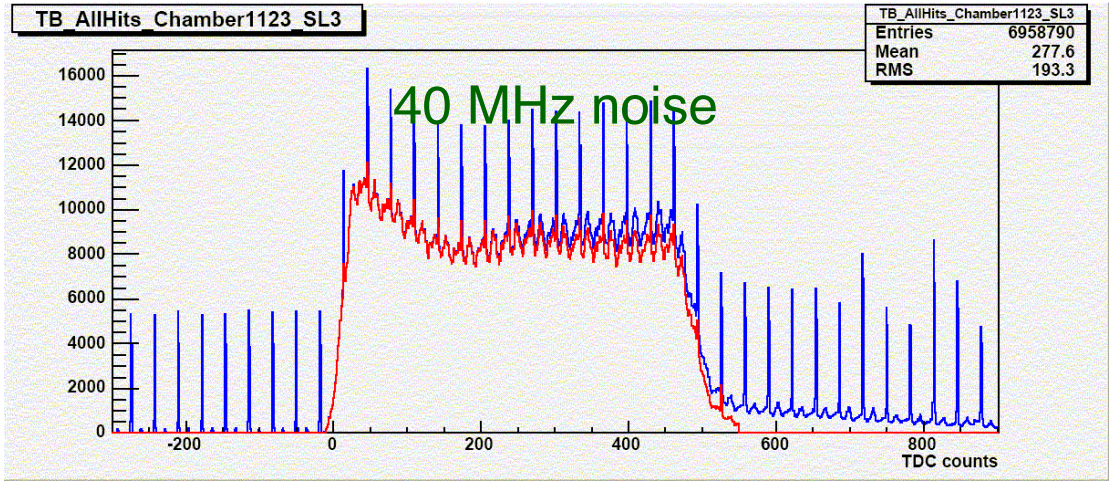
  ✓ global. Average quantites (noise, resolution, effciencies, etc.), total number of dead/noisy channels, …

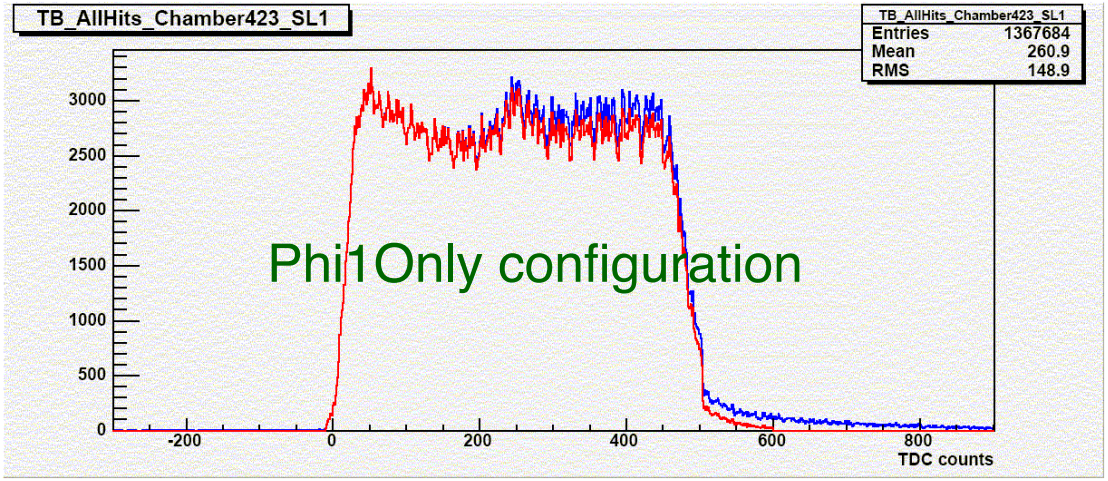
Some bizarre things



Some bizarre things



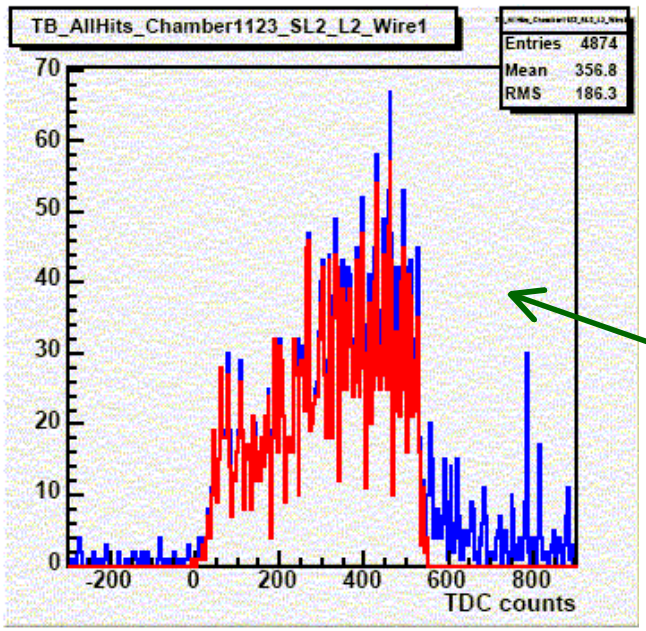




Conclusions

- Commissioning of YB+2 completed
- Next week starting commissioning of YB+1 with 2 people on shift. To be terminated by end of November
- More complete “online” checks are needed
- Offline analysis must aim to leave nothing unexplained and to provide a global overview of the DT performances (we already have tons of data available).

BAK - UPS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Mean 356.8
RMS 186.3
70
60
50
40
30
20
10
0
-200
0
200
400
600
800
TDC counts