

TCMT software status

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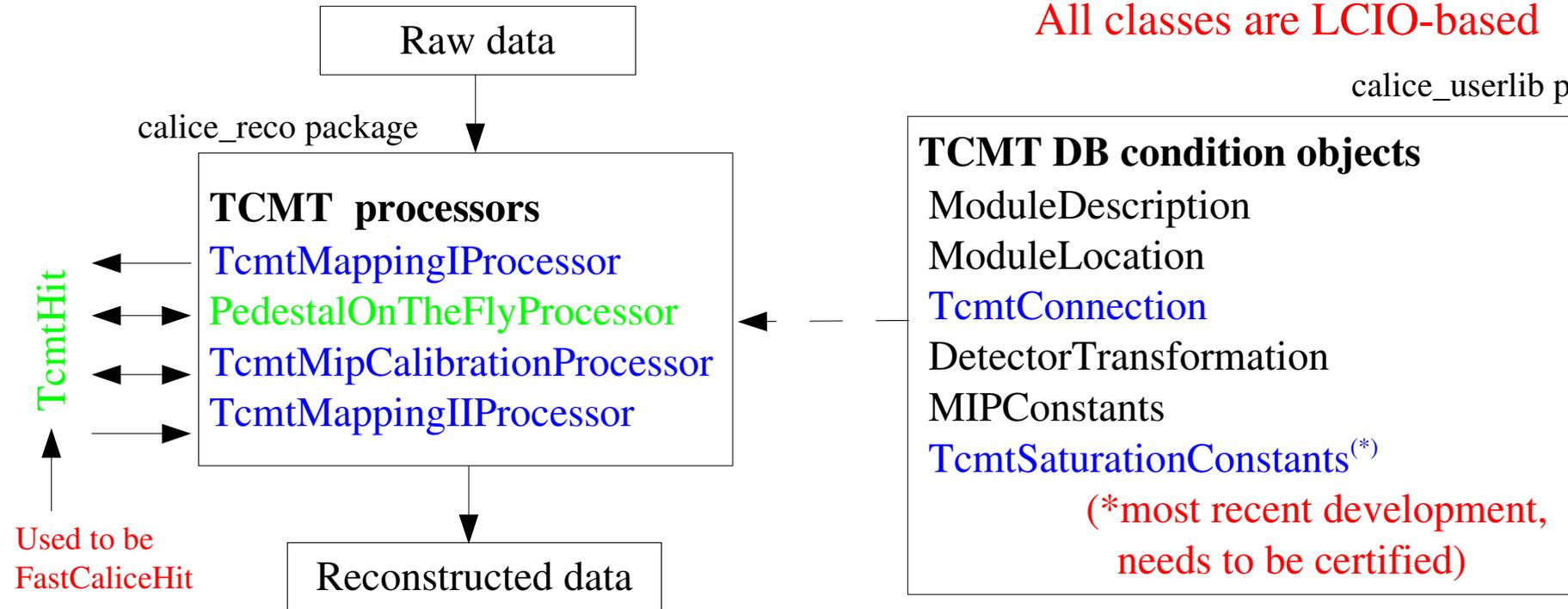
Tcmt software news

- Guilherme is minimally involved with future TCMT updates
 - Still around and available for help and light tasks
- TCMT code has been pretty stable in last six months, with small exceptions:
 - strongest knot of TCMT software on basic HCAL classes untied: new class TcmtHit replaces use of FastCaliceHit for Tcmt purposes
- TCMT saturation constants to be stored in condDB soon (this week?)
 - Correction code still needs to be certified (needs manpower)

TCMT software structure

All classes are LCIO-based

calice_userlib package



Black: reused from old Hcal s/w without changes

Green: reused from old Hcal s/w with minimal changes

Blue: new code for TCMT, but similar to Hcal

While Hcal moved to integrated processors, Tcmt kept old-style of separate processors. Moving to integrated processing for TCMT as well would be a nice move, but not really necessary!

Updates to Tcmt reconstruction

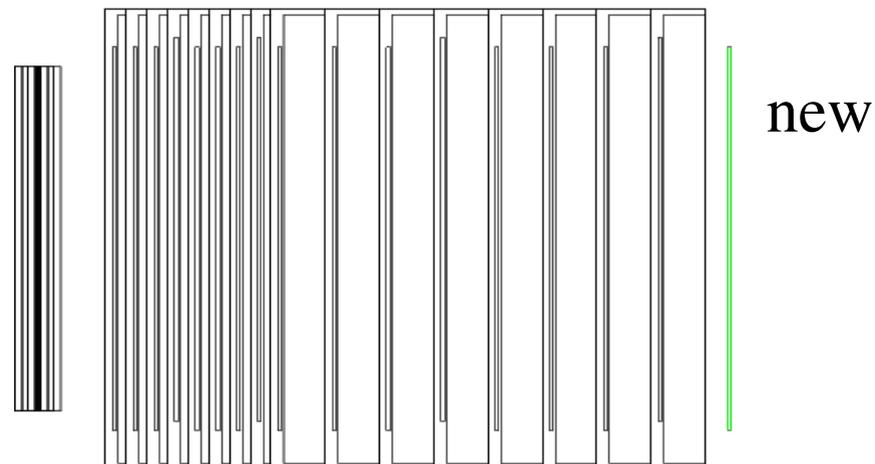
- New class BaseMappingIIProcessor
 - handles most access to DB conditions for Mapping II processor
 - allows TcmtMappingII to be implemented very cleanly, by inheritance
 - probably could be used to simplify IntegratedHcalProcessor too
- TcmtMappingIIProcessor now can output hits as either CalorimeterHits (reco hits) or TcmtHits (RawCaloHits, for noise extraction). Behavior is controlled from steering file

TCMT simulation

- No changes necessary to current driver (TBcatcher06)

- Staggering of TCMT modules (hardcoded!):

- For horizontal strips:
 - layers 2,6,10,14: nominal (y_{nom})
 - layers 4,8,12,16: $y' = y_{nom} + 2.54\text{cm}$
- for vertical strips:
 - layers 1,5,9,13: nominal (x_{nom})
 - layers 3,7,11,15: $x' = x_{nom} + 2.54\text{cm}$



TCMT side views

The digitization process

- Overview of steps, and comparison to AHcal digitization
 - **AHcal:** [noise extraction (data)] + Mokka + ganging + “integrated digitization” (uncalibration, crosstalk, readout smearing, raw noise overlay) + “integrated calibration” + hit selection
 - Hits combined at ADC-counts level
 - **TCMT:** [noise extraction + mip calibration (data)] + Mokka + DigiSim (ganging, crosstalk, readout smearing, hit selection + McMip calibration) + noise overlay + hit selection
 - Hits combined at mip-calibrated level

TCMT digitization in more details

- Noise extraction
 - pedestal triggers from TB data, mip-calibrated, remapped to Mokka cellIDs and saved as TcmtHits (RawCaloHits)
 - All hits saved (no zero suppression)
- Digitization
 - Use DigiSim for hit ganging, optical crosstalk, smearing and simple mip calibration (no SiPM saturation simulated yet)
 - copy noise collections from TB data into the MC event (AppendProcessor)
 - combine mip-calibrated noise + mip-calibrated Monte Carlo hits (TcmtOverlayProcessor)
 - Final hit selection (also at TcmtOverlayProcessor)

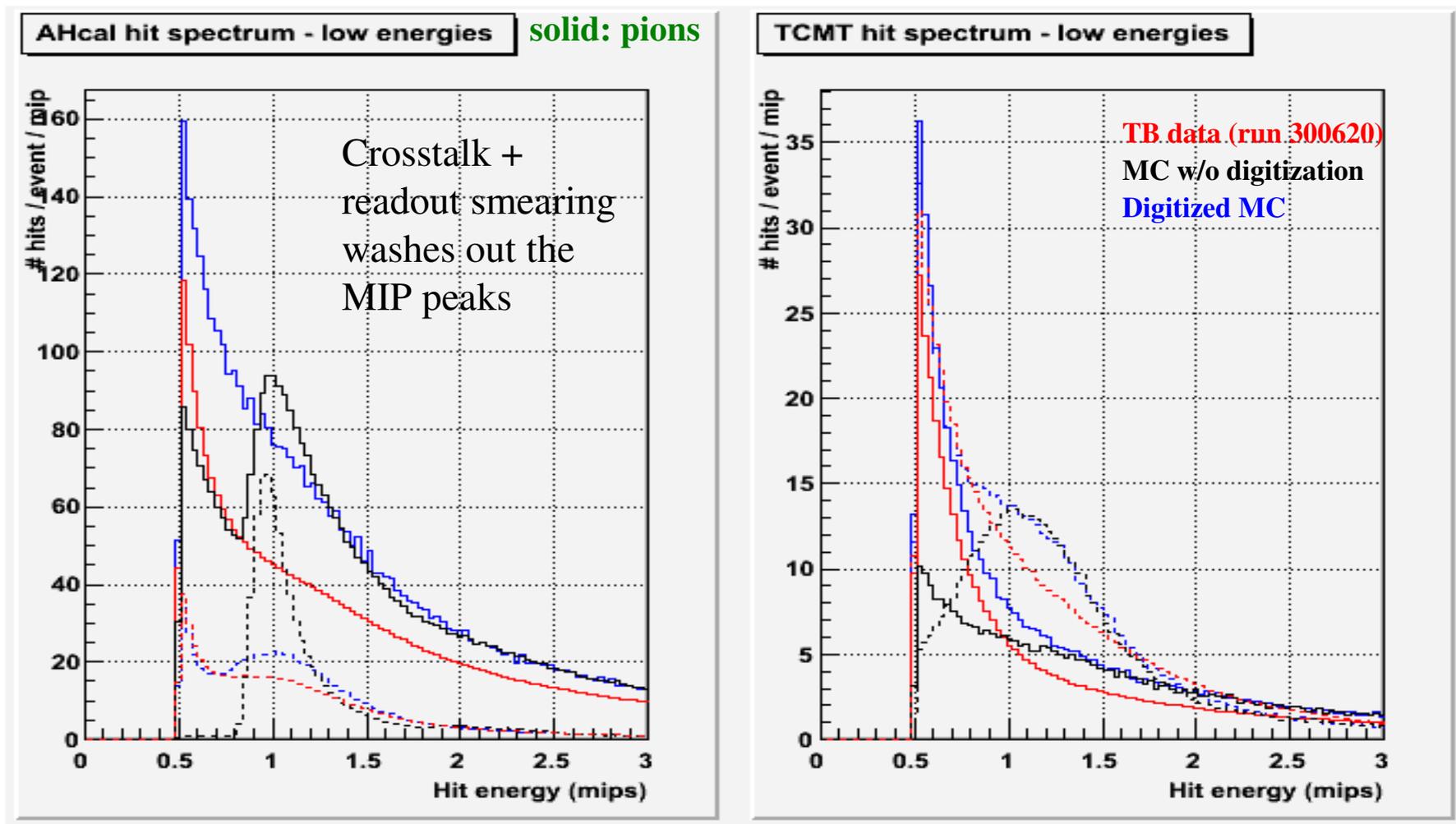
Recent updates to digitization

- noise hits (for overlay to MC) are now, by default, read in TcmtHits format
 - Improved analogy to HCAL noise extraction and processing
 - retained ability to extract and process noise in old format (CalorimeterHit) for backwards compatibility (selected by steering file)
- Final hit selection: $E_{hit} > 0.4$ mips (down from 0.5 mips)

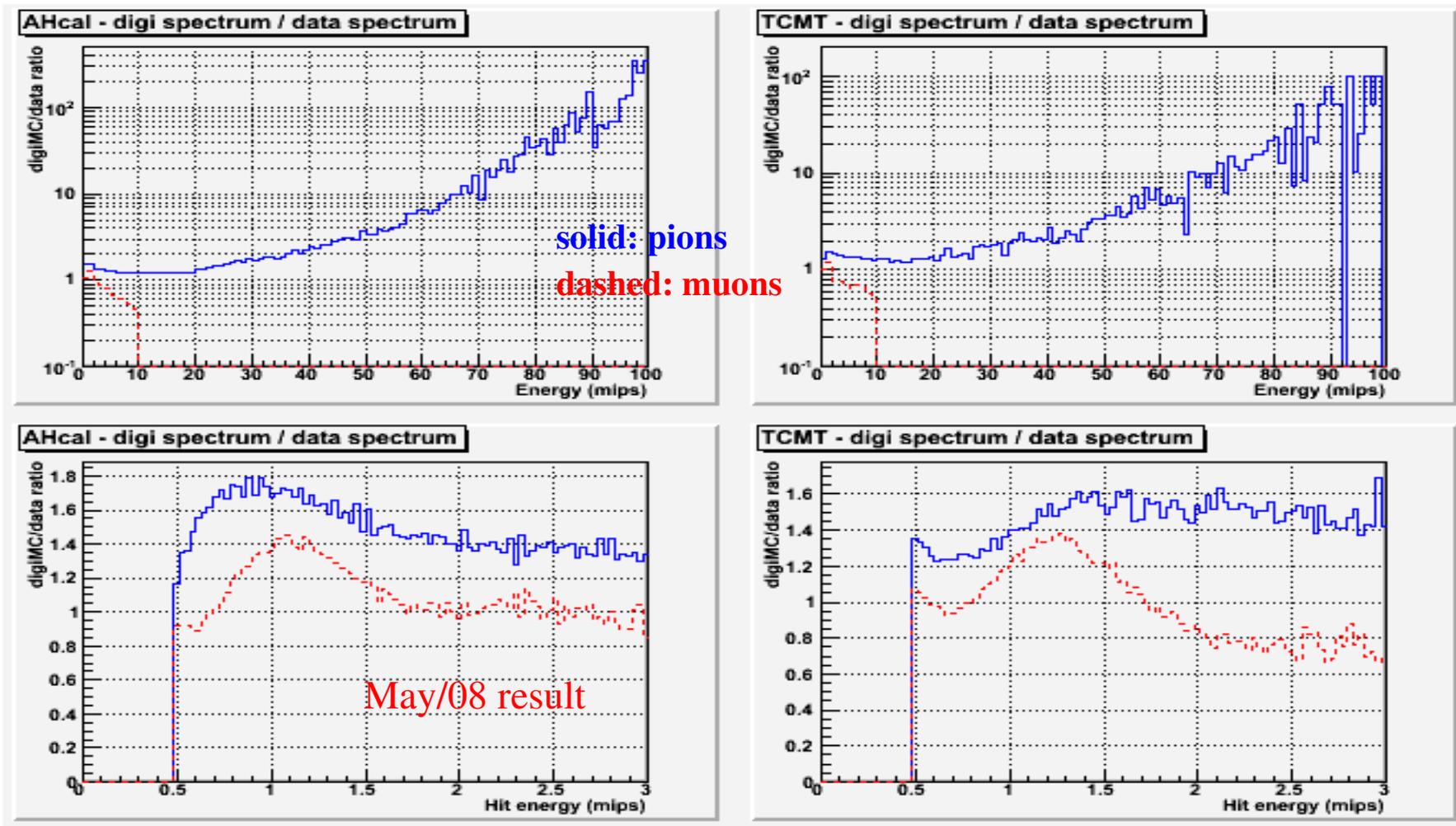
Muons vs. pions: hit spectrum @ low E

dashed: muons

solid: pions



DigiMC/data ratio: 20 GeV pi-

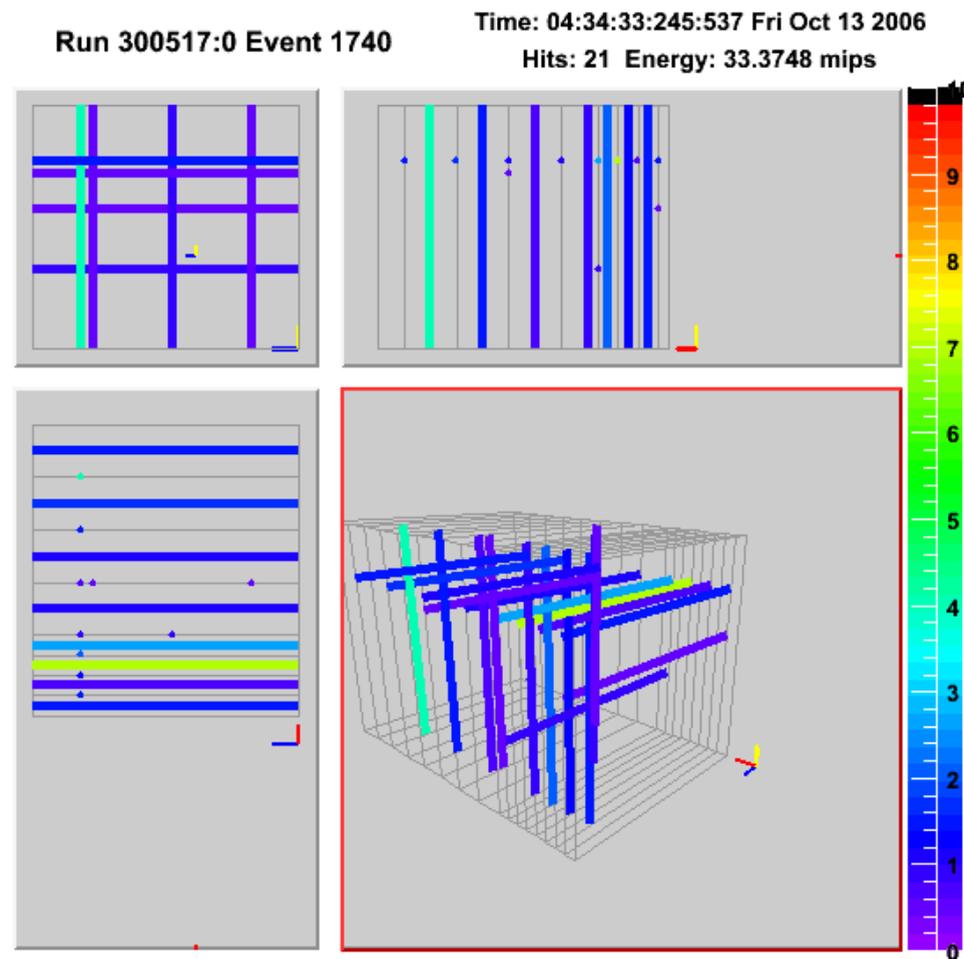


Tcmt conditions data

- All data before 2008 is good
- Had some consistent problems updating the DB for 2008 data
 - Updates work on existing folders
 - Automatic creation of new folders doesn't work
 - Problem started after RedHad → Ubuntu upgrade
- All 2008 constants (mappings, locations and calib constants) had to be stored on “cernbeam” folders temporarily. Timestamps are ok.
- Niels helped to create folder for saturation correction
 - Still could not check/update.

Tcmt in the online monitor

- First significant part of TCMT software to be operational (Aug/06)
- Used for Tcmt commissioning, calibration and early analyses
- No significant updates since then (staggering, rotations)



Summary

- Latest Tcmt code is available from the official CVS repository
Note: saturation correction of the Tcmt hits needs to be certified
- Coarse alignment checks done. Are any refined alignments needed?
 - Oct'06: ~O(few cm in x,y and ~mm in z)
 - July'07: ~O(few cm in x,y and ~cm in z)
 - May'08 and July'08: agrees with sketches
- Conditions database:
 - ready for reprocessing Cern data (Aug06, Oct06, Jul07)
 - Some trouble updating the database, 2008 constants available from “cernbeam” DB folders, to be moved to “fnalbeam” soon