**ATLAS LAr Calorimeter Readiness for LHC Run 3**

**Motivation**
- Replace old Trigger Towers with Super Cells (SCs) [2]:
  - Finer granularity (factor ~10)
  - Access to longitudinal shower shapes
  - Move to digitized samples
  - Allows to keep p, thresholds with increased luminosity due to better electron vs. jet rejection power

**Readout Electronics Upgrades**
- **LAr Trigger Digitizer Board (LTDB):**
  - Digitize super cell signals
  - Send signals to back-end electronics
  - Form layer sums similar to Run 2 conditions for legacy readout

- **LAr Digital Processing Blade (LDPB):**
  - LArC + LATOMEs + IPMC
  - LATOMEs (see photo below) for reconstruction of transverse energy
  - Send information to L1Calo system
  - IPMC unit for control and monitoring

**Further updates and Validation**
- **Cosmics Data Taking**
  - Cosmics data taking in September
  - First physics data measured by new Digital Trigger system, matching well with main readout
  - Validation of all components in new readout chain

- **Legacy analog trigger validation**
  - Half FE crate calibrations to hunt dead channels after FE crate installation
  - Analog connectivity scans to check trigger tower mapping
  - Timing mapping looks good

- **DCS status**
  - LTDB FSM added to LAr tree at P1
  - ATCA project added, include LATOME
  - temperature and fan level monitoring

**References**
- ATLAS Collaboration, Event Displays from Run 3 splashes and collision data, https://twiki.cern.ch/twiki/bin/view/AtlasPublic/EventDisplayRun3Collisions

**Phase-I Upgrade / Digital Trigger**
- New Baseplanes installed:
  - New slots for LTDBs
  - Handle increased transmission of signals

- New Layer Sum Boards (LSBs):
  - Produces finer cell signal sums
  - Every readout board taken out of cavern and refurbished

**Cosmics Data Taking**
- Successful participation in Pilot Run
- Data taken with both readout paths in splashes and test collisions [3][4]

**Digital trigger validation**
- Pulsing scans used to verify channel mapping
- Energy and timing of SCs checked with pedestal and pulsed runs, stability monitored with long runs
- Computed energies show good agreement with main readout data [3]

**TTC changes**
- LTPIs replaced with new ALTI boards
  - Combine functionalities of four modules in one board
  - Fewer cables, prevent aging effects
  - Allow to run A and C side in parallel
  - New firmware fixed many issues
  - Timing aligned for legacy and digital system
  - Now stable TTC system

**Pilot Run**
- New TTC system: LTPIs replaced with new ALTI boards
- DCS project updated to new setup
- Legacy analog trigger path validated and tuned
- Successfully taken first data

**Summary**
- Phase-I installation finished
- LTDB validation in final stages
- New TTC system: LTPIs replaced with new ALTI boards
- DCS project updated to new setup
- Legacy analog trigger path validated and tuned
- Successfully taken first data

**LAr is ready for Run 3!**

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