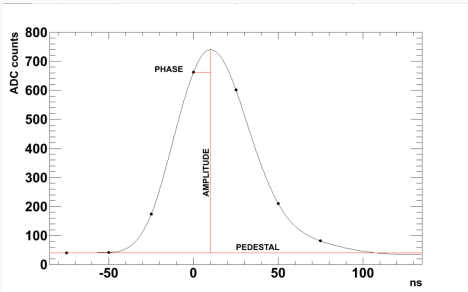
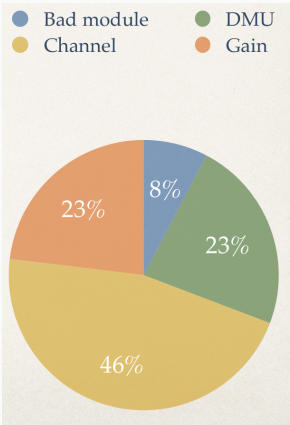
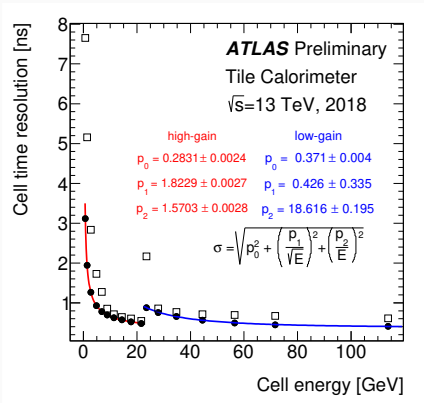
The Tile Calorimeter time calibration

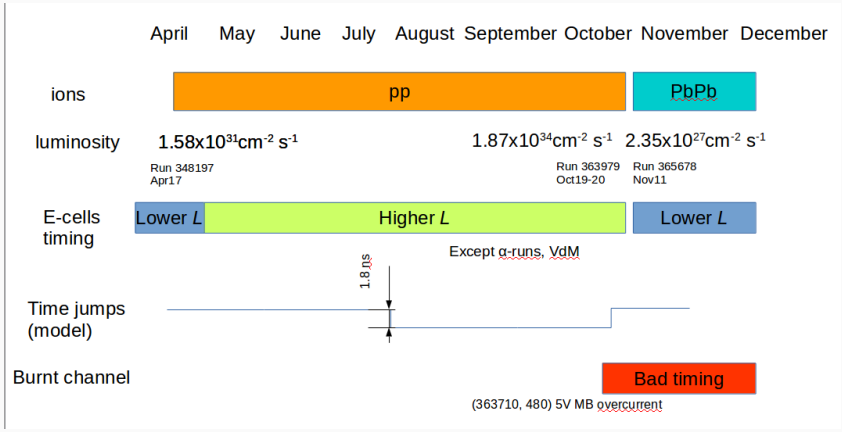
Motivation. High-energy proton-proton collisions at he Large Hadron Collider lead to production of jets and hadrons measured by the hadronic Tile Calorimeter at the ATLAS experiment.

The energy reconstruction depends on a synchronization between a central ADC count and the maximum loss of particle energy during its passage through the detector.
→ The time calibration is performed with multiple methods and redundantly monitored.









Goal → result. Synchronization of all the readout channels within ∼1.5ns was ensured throughout the whole Run 2 data-taking period.

- Prepared refined time calibration conditions for reprocessing of the data collected in 2017-18.
- Time resolution below 0.4 ns for cells depositing .
- The time offsets above 2 ns were identified and corrected for accordingly. Typical problems were recognized and solutions were strategized.