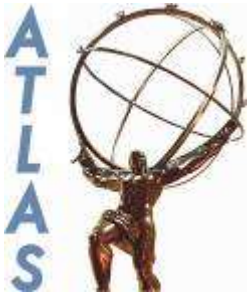
Athena OF Status & PileUp Studies



Ximo Poveda

Latest developments ongoing

- TileSimAlgs:
  - Small updates for new configurables jobProperties
- Configurables for Reconstruction:
  - Talked with David Rousseau who gave some good advices to adapt TileCal jobOptions
    - Modify python Getter modules so that only one module is used per algorithm, e.g.: TileRawChannelMaker
    - Use custom jobProperties to select AlgTool to be used in the algorithm, e.g.: TileRawChannelBuilderFitFilter, TileRawChannelBuilderOptFilter, TileRawChannelBuilderManyAmps and/or TileRawChannelBuilderFlatFilter.
  - Need to redo the getters and define jobProperties to use. Rest of the jobOptions already moved to configurables.
  - And check that everything's ok...

Latest developments ongoing (2)

- Documentation:
  - Software Documentation Review for calorimeters on 23 July
  - Need to provide some Doxigen documentation
- Optimal Filtering constants calculation
  - Code almost ready
  - Missing: right names in folders to be understood online. To be solved with Karl today

Optimal Filtering WITHOUT PileUp

- Going into details with FULL ATLAS simulated data:
  - Some channels once reconstructed show phases $\tau \neq 0$ (hits synchronized if particles arrived to the center of the cell, small variation in reconstructed time if they arrive to the cell boundaries).
  - ManyAmps method only considers amplitude at $\tau = 0 \rightarrow$ Optimal Filtering should perform better in these cases
  - Simulation with $\Delta\tau = 1$ for hits and reconstructed with ManyAmps and OptimalFiltering
  - Ongoing

Optimal Filtering WITH PileUp

- Talked with Paolo Calafiura about PileUp digitization and gave me some indications on how to digitize with high luminosity pileup ($10^{34}\ m^{-2}s^{-1}$). He clarified some of the parameters in the digitization (not well documented anywhere).
- At Low Luminosity ($2\times10^{33}\ m^{-2}s^{-1}$):
  - RawChannel Level:
    - Produced small sample (1.1 kEvts) with and without minimum bias pileup to compare the behaviour of known quantities (amplitude, pedestal, etc.) after pileup addition
    - Just started, and need to understand it in detail
  - Weights:
    - Still not tried with proper OF weights (with autocorrelation matrix from MB pileup)
  - Total Energy Level:
    - Obtaining first results making sense, but they need to be fully understood