

TOF Offline Validation and Monitoring: Status & Plans

- Architecture:

- 2 separate modules (will be in TofValidation repository)

1. TofValidationModule:

- Automatically ran by offline ACEs
- Output: “basic” histograms for Production validation
- Commissioning of new software releases (10K and 100K tests)
 - Compare with results of previous releases
 - Compare with default histograms
- Data Production
 - Monitor relevant quantities with time
 - Spot possible problems related with mistakes in production (DB constants, etc...)

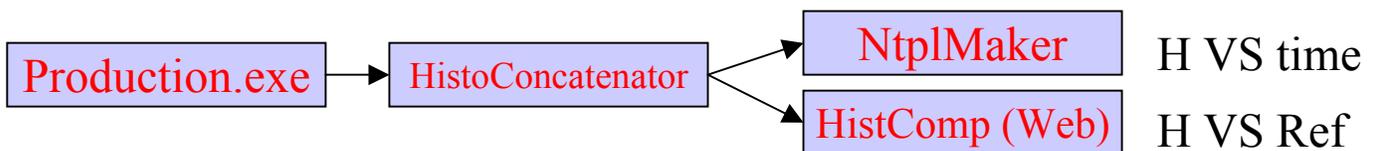
2. TofExpertModule:

- Ran by TOF and/or interested peoples
- Output: root n-tuples → C Selectors
- All possible TOF infos are stored in the ntuple
- Offline reconstructed + reproduced in the validation module quantities

- Interiors design:

- 1. **TofValidationModule:**

- Implemented histograms:
 - Online checks:
 - YMON-like and TofTools-like histograms
 - Offline quantities:
 - Basic distributions: occupancy, pulses, charge, time, TOF, phi and eta matched tracks
 - Correlations: TL-TR VS $\ln(QL/QR)$, Z_tof VS Z_tracks
 - Efficiency and PID:
 - » match efficiency (only using std. reco)
 - » tof reconstructed mass and mass VS p
 - Extrapolation to TOF based on geometric extrapolator
 - TOF reconstructed VS reproduced algorithm (using DB calibration info).
- Running Procedure:



2. TofExpertModule:

- Implemented (or to be-) info-blocks:
 - Online:
 - TOFD bank quantities
 - HV status from DB (not yet implemented)
 - Offline:
 - TofPulse, TofHitBar, TofTrackPulse, TofMatches, TofTrackView
 - DefTracks block
 - Emulation of the reconstruction algorithm
 - C Selectors:
 - Occupancies:
 - » Number of DefTracks per bar
 - » Number of selected(*) track per bar
 - » Number of bars with 0,1,2 hits per events
 - » Number of bars with a Matched tracks
 - » Number of bars without an extrapolated track and with 1,2 TOF hits

... continue

- Efficiencies (Matthew recipe):
 - Numerator in ϵ calculation:
 - PMT hits in both ends of bar
 - + Z matching within x ns
 - + Z matching within n sigma (TL-TR residual width)
 - previous condition for any of the traversed bars
 - TofMatch in the given bar
 - TofMatch in any bar
 - Denominator:
 - » ϵ VS Pt (custom tracks hitting the TOF)
 - » ϵ VS 3 different classes of selected tracks(*)
- Timing and PID (only basic quantities yet):
 - » Reconstructed masses, masses VS Pt
 - » Time differences assuming K, π ,p VS Pt
 - » Phi \rightarrow KK plot
 - » TOF-TOF(π) for π_s from D* \rightarrow D0 π_s plot
- Running Procedure:



(*) Low Pt/High Pt/All Pt DefTracks in the TOF FV

Time schedule

- **TofValidationModule:**
 - Code: ready (only minor refinements)
 - NtplMaker/Plotter:
 - Framework ready
 - Adaptation to TOF in progress
 - Web Interface (Pasha): in development
 - TofValidation repository will be created next week
 - **TofExpertModule:**
 - Code:
 - Framework ready
 - Few quantities still missing
 - C Selectors/Macros: only efficiency macro ready
 - **Expected time to be completed:**
 - TofValidationModule: 1/2 week
 - TofExpertModule: 2/3 weeks
- ... but validation histograms will be available early during the development phase