HLT Monitoring Status report

DESY – HU – Hamburg – Zeuthen
ATLAS Group Meeting

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HLT Data Quality Monitoring

Info to be monitored, ideas and examples:

Slices

- B-slice
- E/γ
- τ
- Jets (L2 und EF)
- Muon
- E_T miss

info to be monitored depends on / should be provided by PESA algorithms

common info for all slices:

- η, ϕ, N_{object}
- cut variables

specific info for different slices:

B-slice: p_T^{rel}, $p_T\mu$, I_p, J/ψ sec. vertex

E/γ: Etot, hadronic E fraction, cluster shape, track-cluster matching, $M_{\gamma\gamma}$, M_{ee}

τ : muon multiplicity Nμ, E_T miss shower shapes, cluster-track matching,M_τ

Jets: R, E_T, M_{jj}

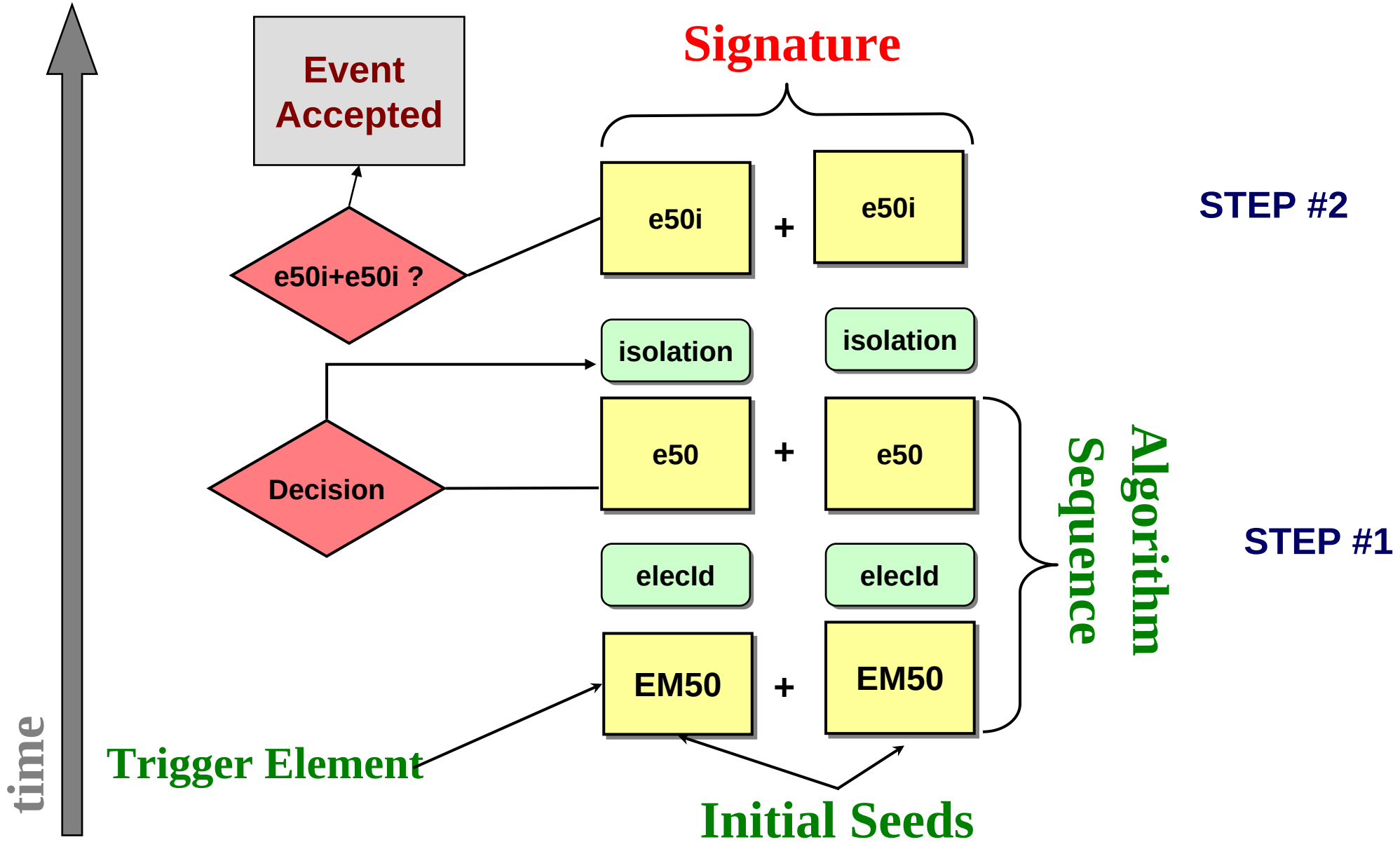
μ slice: $M_{\mu\mu}$

E_T miss: $E_x^2+E_y^2$, ΣE_T, leakage

Supervise the HLT Steering

- HLT Steering drives the data flow through LVL2 and EF
- We need information of processor farm performance and decision monitoring (rates and quality)
- Need to control the data flow rates through the system

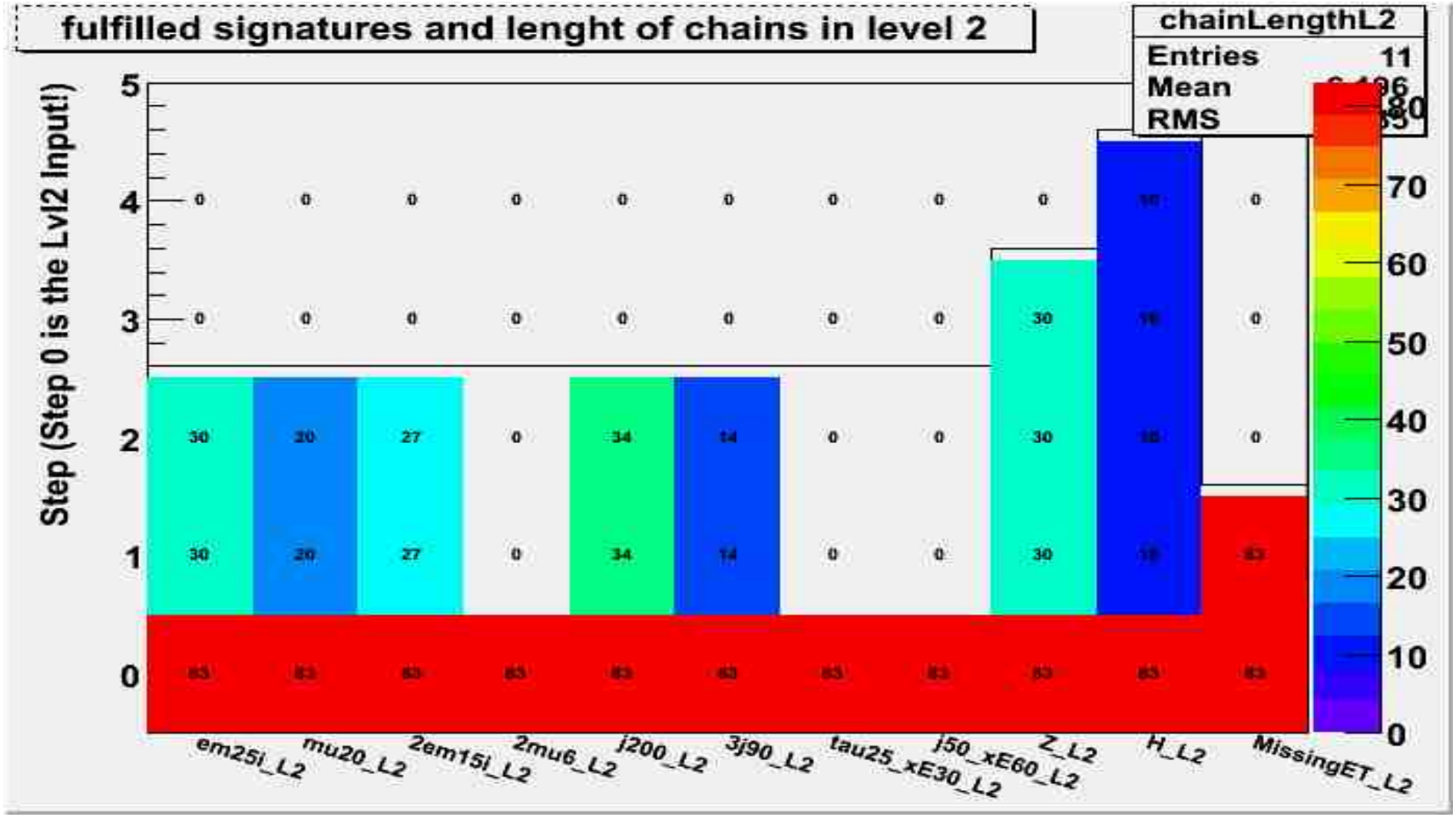
Trigger Steering



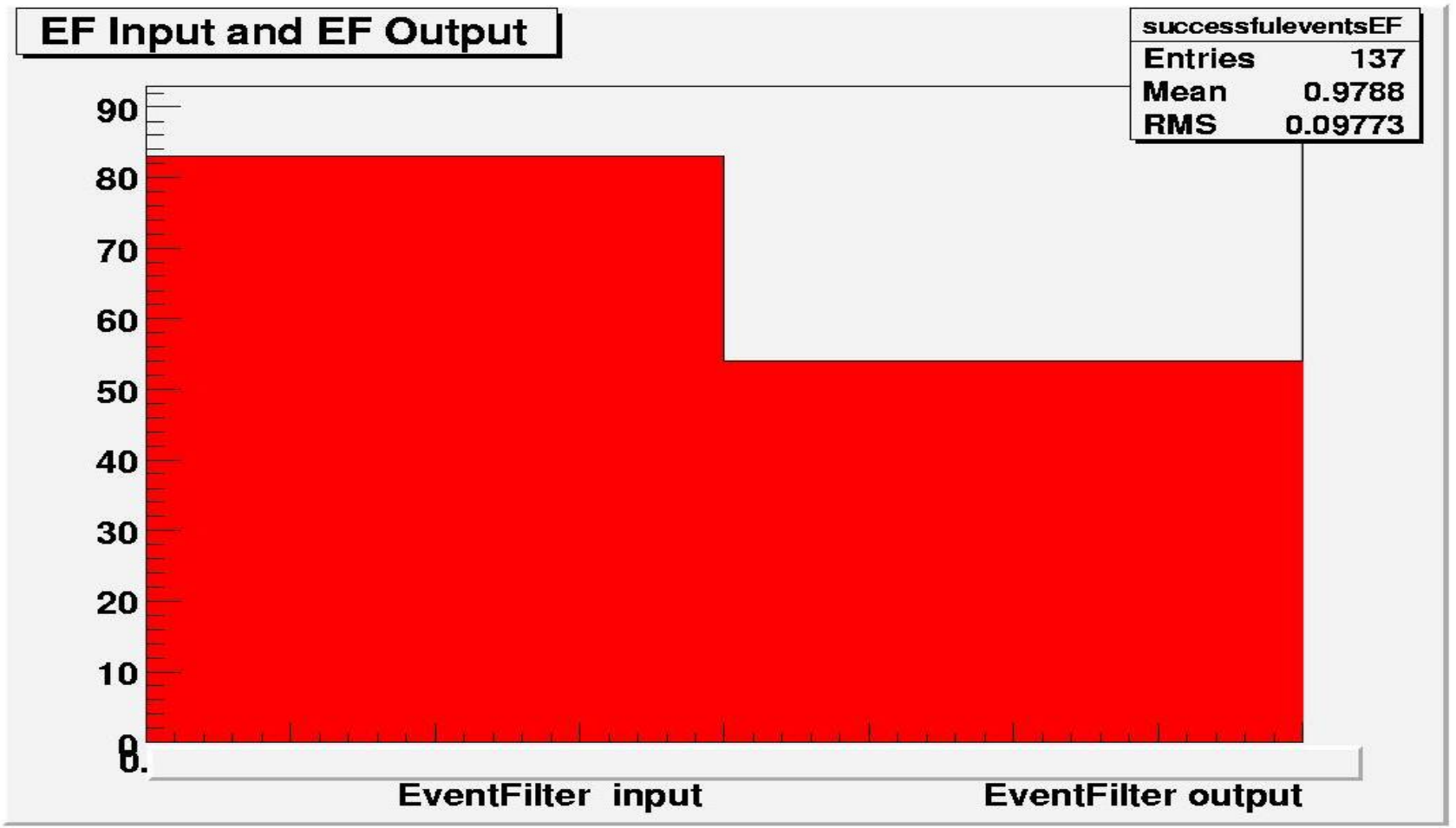
What has been done

- Monitoring code is separated in LVL2 & EF part
- Small classes with 2-3 remits only are produced
- Whole monitoring code works in the ***nightlies*** and is available in ATHENA in release 13
- We have now availability of rejection power, number of accepted events per chain, signature and trigger elements
- And in addition the number of real events is accessible

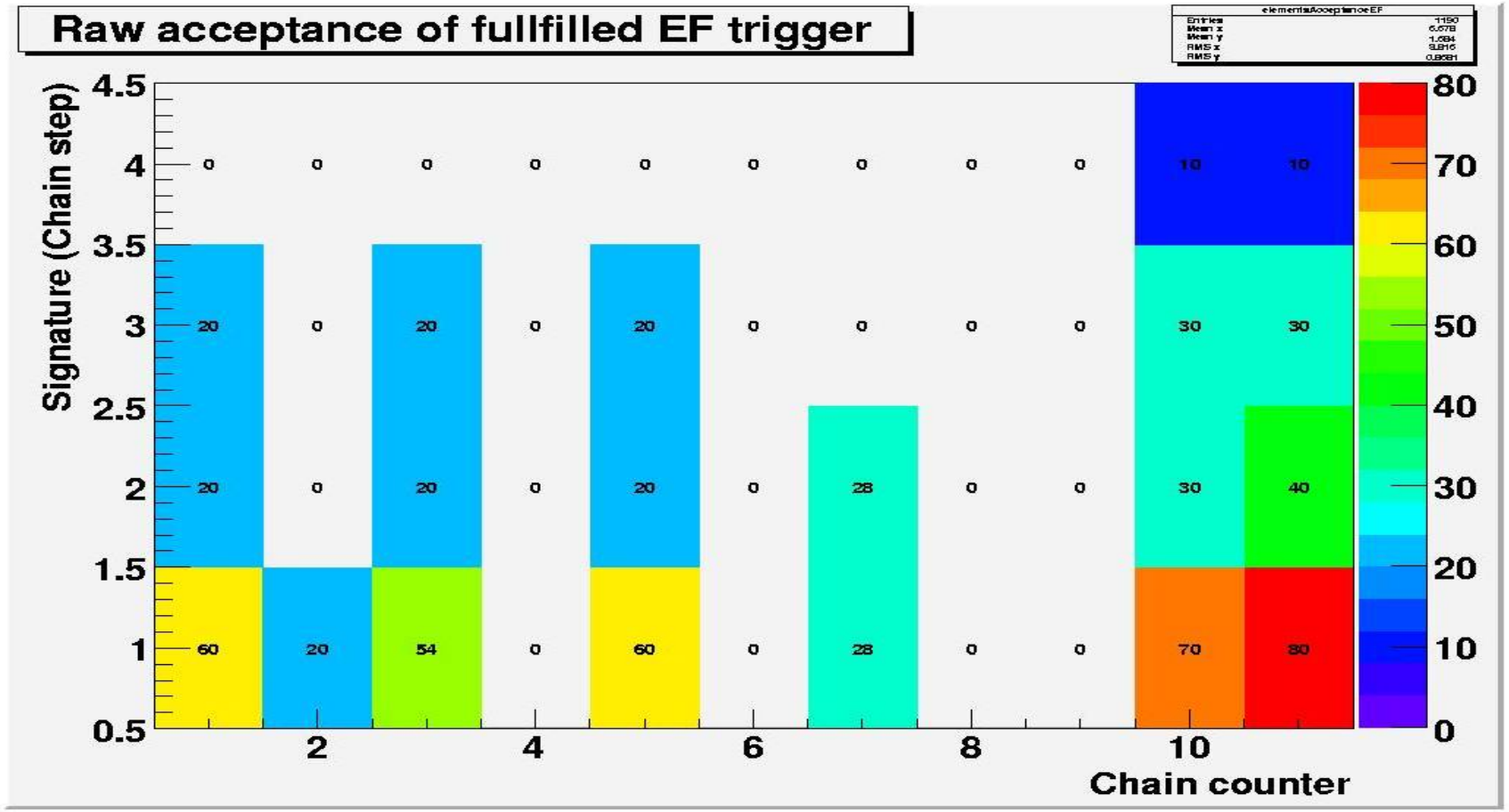
Nr of Events accepted by Signatures



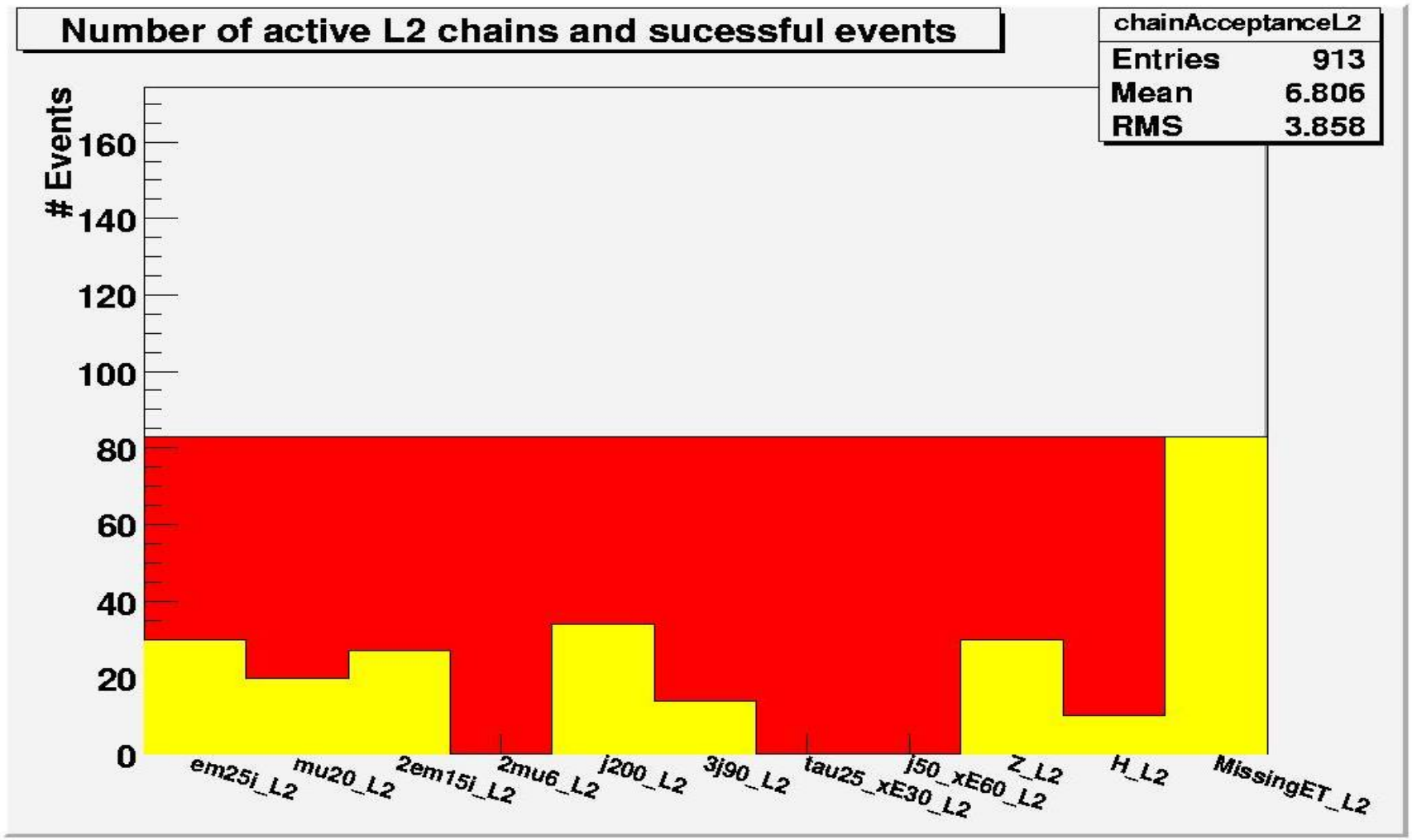
Event Rate for Event Filter



Nr of active Trigger Elements



Rejection power of LVL2 (before passthrough and prescale)



Rate Calculation: time stamp vs. processor time

Time of Event-header:

Measurement:

Rate of events accepted for physics processes (trigger selectivity)

Advantage:

precise (~ ns) fast available

Disadvantage:

Time is fixed for the whole process

Processor Time:

Measurement:

Rate of events processed on individual CPU (processor farm performance)

Advantage:

Generates the best rate for technical monitoring

Disadvantage:

Determination takes to long (some μs)!

Lumi Blocks

- Also rate histograms for ***each lumi*** block needed to store in the database
- **Idea :** (not finished yet)
- Create each histogram as an array of histograms of the same type and fill **hist_x** for **lumi block number x** (already in the code)
- **Perhaps problematic for online monitoring:**
- overlapping of several adjacent lumi blocks
- (but solvable with statistic!)

Conclusion and Outlook

- Rate (steering) monitoring in good shape
- Code will be fully available for release 13
- Next steps: Luminosity blocks, test on the processor farm in Zeuthen (atlhlt[1-5])
- Test with “real” data stream (MC instead of dummies events and trigger set up)
- Data Quality Monitoring:
  - Meeting with experts from CERN at Zeuthen at 28th of Feb. and 1st of March (**every one is welcome to contribute**!)
  - Conceptual discussion ongoing

Idea: combine both options!

- For rate calculation use the time stamp and processor time as crosscheck!
- Update of processor time for every 75 event

- Processor time and Time stamp also inseret in the code
- Time information in form of a 1-bit histograms available