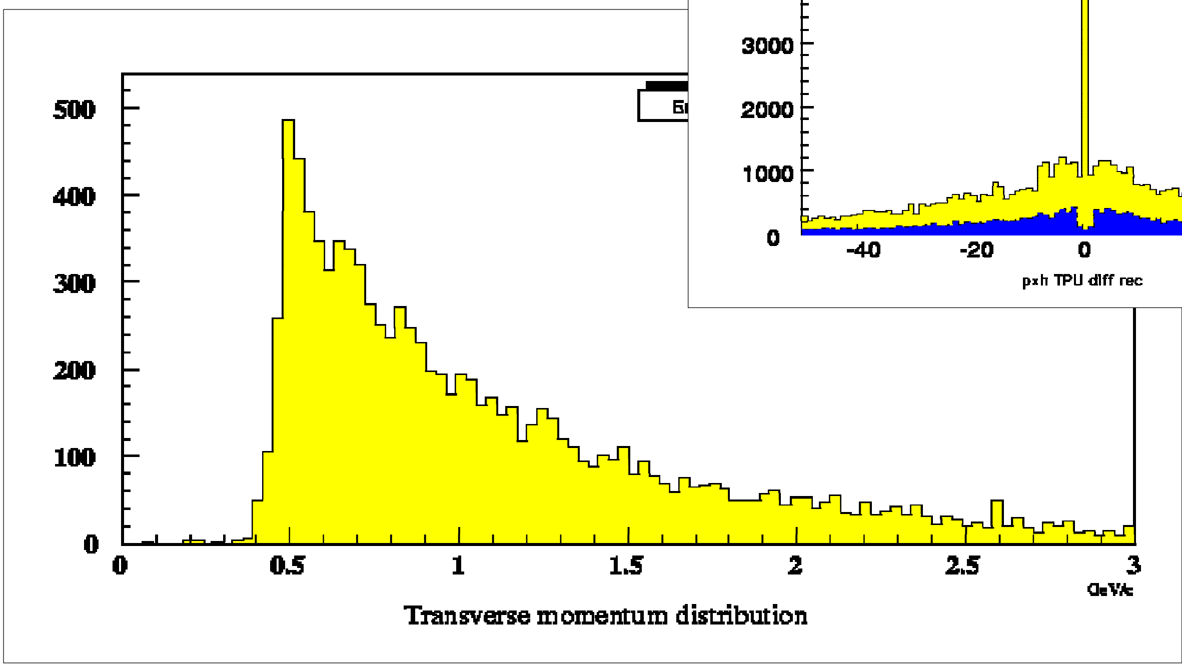
Track Parameter Unit

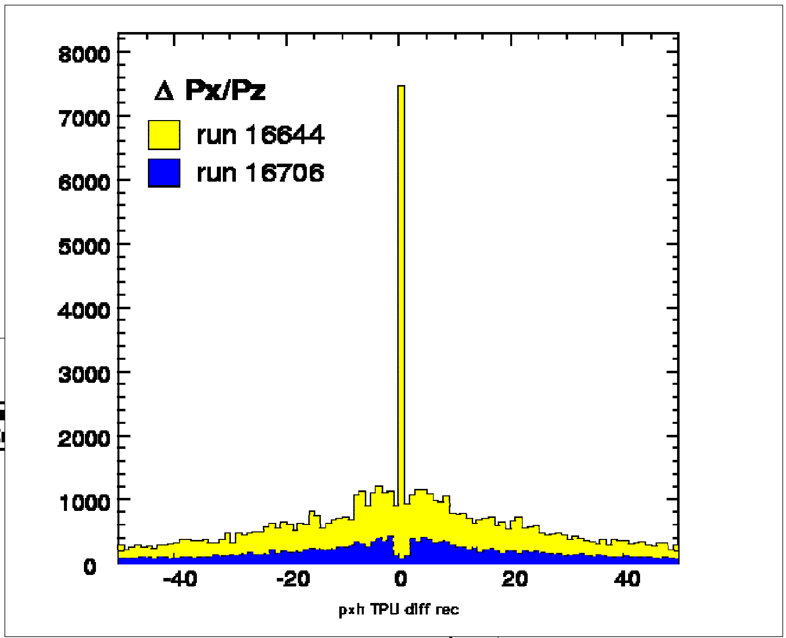
TPU tasks

- Calculations of kinematical parameters (Px, Py, Pz, q)
- Clone removal
- Multi message rejection
- kinematical cuts (P, Pt)

Status

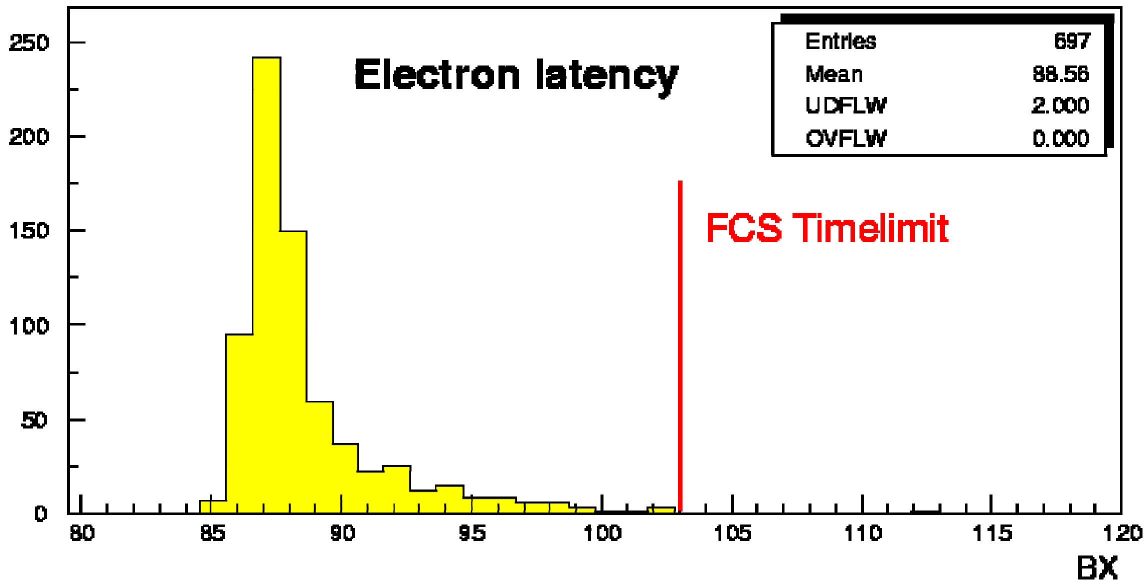
- TPU in routine use
- Lookuptables developped and tested with MC
- Test Vector Test showed 100 % agreement
- No problems showing uo during data taking
- Double track rejection working
- Cuts working fine

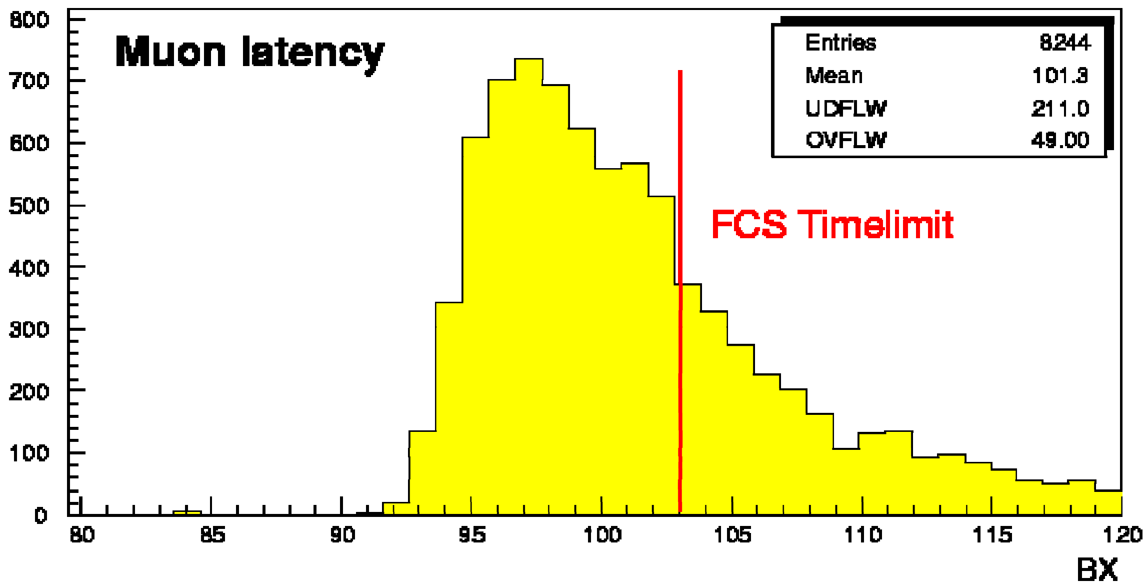




Trigger Decision Unit: Latency

- TDU has to send Trigger OK to FCS and FCS requests information from FEDs and TDU
  - First Trigger has to be within 10.6 μs (ΔBX = 103)
  - All tracks have to arrive within 11.9 μs in TDU





Percentage of lost Muon tracks: 12%

Startup Tests & Monitoring

Set of monitoring and control tools checks status of system before each run and during running:

- Before running:
  - Testing of all links
  - Network connection test
  - Wire memory content (occupancy distribution)

- Permanently monitoring during running (can be also used for later analyses):
  - TDU output record:
    - Number of triggers for triggered events
    - Number of tracks
    - Triggered BX numbers
    - ID of tracks
    - FIFO overflow
  - Hardware components:
    - In– and Output rate of messages per TXU
    - Link errors found in TFU receiver
    - Coincidences between WIM

- Total Setup (connections, TFU's etc.) are written out to Database.

Efficiency Summary

- Results are still preliminary !!!

- Analysis of FLT has been done in two ways:
- »Extrenal track« method ⇨ Electrons
- MC/Data comparison ⇨ Muons

⇨ apply both to Electrons and Muons

- Include the best knowledge/understanding in simulation:
  - Masking of links in TFU
  - inefficiencies due to 1.5% bit error
  - μ dead channels
  - μ chamber efficiencies

⇨ Try to understand the MC ⇦ ⇨ data discrepancy

- Include »online« features of the FLT:
  - congestion of messages (»pileup«)
  - latency

We have to see in simulation what we see in the data

... but this will take time !!!!

Outlook

What has to be done during the shutdown ...

- **FLT Hardware**
  - TFU:
    - ways to increase efficiency
      - require only 2– instead of 3–coincidence
      - allow one leyer not to be used
    - study message congestion
    - latency
      - skip MU4 for Muon events
      - Ecal Pretrigger bremsstrahlungs correction
    - Lookuptable algorithm
      - cell spacing – implement real wire position instead of mean position

Backup all changes to hardware by MC studies

- **Linkboard and Data Links**
  - Event by event comp. for detector/FLT data
  - 100 % efficiency for links –> modify software
  - cooling of boards: avoid dying chips
- **Include missing parts**
  - ITR
  - MUON Pixels
  - High Pt