MTE 2011 workshop
PS BI Instrumentation Status

Stephane Bart Pedersen

BE-BI 2011

Core Beam Instrumentation for MTE

PS Ring:
- Orbit system
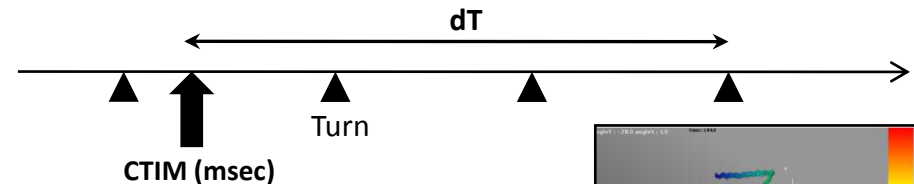- Wire-scanners
- BLMs
- DC BCT

TT2:
- BPM (trajectory)
- SEM grids (profile)
- Fast BCTs (transmission)
- BLMs (losses)
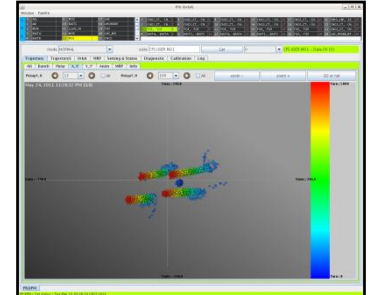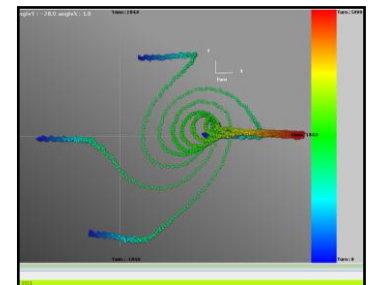
Orbit System

J. Belleman / S. Bart Pedersen

Settings to acquire

- Selection of a CTIM in msec's from start of cycle
- Selection of a delay in turns (relative to the CTIM)

2010-2011 Improvements

- TMS cycle settings:
  - More stable including for specific MD cycles
- New firmware:
  - H8: all buckets acquired
  - H16: and second injection in the correct bucket
  - Max. Turn delay increased to 1.5 million
- Expert GUI adapted to the MTE:
  - X/X' and Y/Y' image plot (selection of 2 different PUs)
  - 3D plot + rotation in 3D

dT

Turn

CTIM (msec)

Orbit System (2)

J. Belleman / S. Bart Pedersen

Current issues

- Synchronization issue with respect to revolution period
  - If msec time != 0 (so also for ejection timing)
- AD cycle issue (corrupt TMS settings)
  - Other USERs are not affected – reload necessary

Hardware expert investigating.

Orbit System (3)

J. Belleman / S. Bart Pedersen

Future improvements

- Data search using turns instead of msec's
- New option to acquire last N turns to be implemented/tested
- New FESA Linux server being tested:
  - Acquire large number of trajectories (all PUs/one bunch)
  - Performance tests ongoing
- BI Expert GUI not sufficient
  - MTE dedicated application has to be written by OP/ABP
- Firmware bugs under investigation

→ **Big efforts to solve problems
   and to find solutions inside BI**

TT2 Pickups (BPM)

T. Bogey / L. Jensen

- New FESA server BPMTFL to acquire digital positions
- One position value (H/V) per PS turn (max 5)
- TT2 with PS timing context
- Selected PU with analogue signals (Sampler) to be specified
- Scheduled for 2012 start-up (YASP integration)

TT2 SEM-electronics consolidation (LS1)

E. Bravin / A. Guerrero

- Presently foreseen electronics (LN4) (ADC ~192Khz)
- Recent request to acquire turn by turn (ADC ~1MHz)
- → Feasibility study to be done
  To be discussed with OP/ABP

Wire Scanners

B.Dehning / A. Guerrero

- 4 new tanks with bigger aperture to be installed next C.S.
- New photo-multipliers, one already being tested
- New bellows allowing more scans
  - 50000 scans instead of 5000 being verified
  - Installed next C.S. (time and resources)
- WS68 to be used for the MTE, is ready
- 20[m/sec] might be possible with the new bellows
  - To be confirmed
- New Fast WS prototype
  - Installed in the PS ?
- Data fit results calculated by the OP application
  - Should be made available off-line

Beam Loss Monitors

B. Dehning / S. Jackson

- 110 monitors (ring + TT2 + TOF) to be installed in parallel (LS1)
- Time schedule depending on prioritization
    - All LHC injectors concerned
- Cable type proposed awaiting green light from EN/EL
    - LIU/MTE budget to be confirmed
- Controls infrastructure to be requested to CO
- BI acquisition modules being designed
- Interlocked BLMs:
    - Monitor type to be chosen between LHC IC or LIC
    - More precise specification from OP needed, including for TT2
- Fast measurements:
    - Choice of detector to be made (pepII/diamond)
    - Acquisition likely based on OASIS
    - Specification, number and location to be discussed with OP/MTE
    - LIU Budget still to be approved

Fast BCTs

L. Soby / M. Andersen

- All TT2 trafos controlled by TRIC card
- TRIC card cross-calibration campaign ongoing
- Precision of the data (absolute error) expected soon
- Consolidation project (LS1) to improve detectors and cables
- Intensities stored in long-term storage

DC BCT (ring)

P. Odier / S. Bart Pedersen

- Detector and cables to be consolidated (LS1)
- New electronics being designed
- Base Line Restoration and calibration software features to add
- Expect high intensity beams acquired with an accuracy of 1%

Conclusions

- MTE project brought new requirements for PS Beam Instrumentation
  - Included whenever possible in existing systems (LHC remains priority)
  - Useful input for consolidation/upgrade
    - TT2 BPMs with PS turn-by-turn capability
    - PS BWS tanks and studies
    - Discussions remain (SEM Grids, Fast BLMs)
- Some issues were observed
  - Some are being looked into (Orbit)
  - More improvements expected after LS1 (BCTs)
- BI continues to work on improvements for PS BI
  - Some bugs are hard to find and correct ..
  - Further discussions required to find viable solutions
    - Short and longer term