

ALICE Offline week  
CERN, 5-9.7.2010



# SPD Offline status

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in collaboration with Annalisa Mastroserio (CERN)



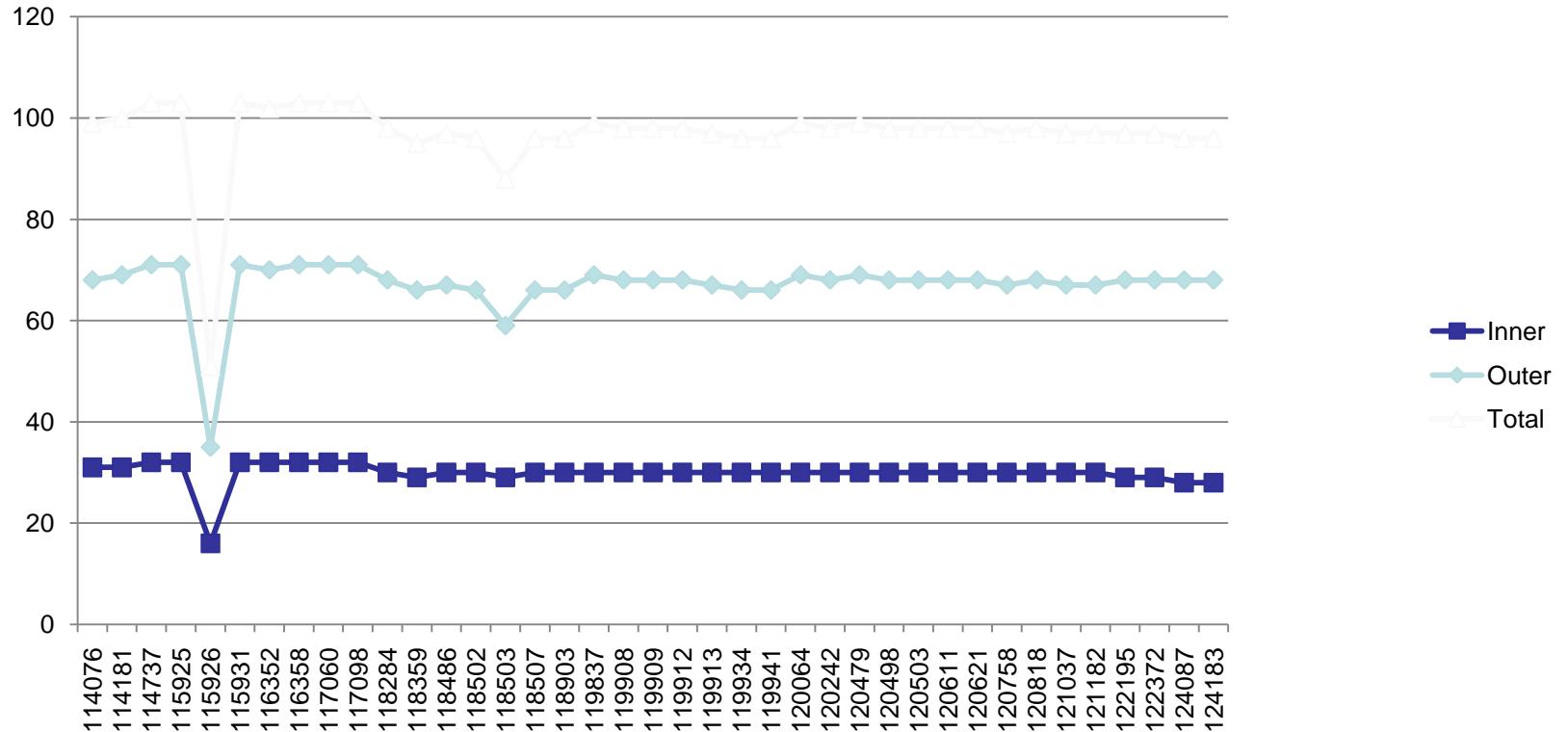
# Status overview



- ❑ Detector status, OCDB files:
  - List of active modules vs time
  - Handling single dead/inefficient pixels for MC
  
- ❑ Quality assurance issues:
  - Raw-QA histos for the DQM
  - Raw-QA checkers implemented
  
- ❑ Geometry and other issues:
  - Update in the forward region (Mario's talk)
  - Update of the "ideal" sector geometry (Andrea et al.)
  - Trackleter:
    - Updates for tracks+tracklets multiplicity estimation (Ruben)
    - Include inner layer cluster labels in ESD (Mariella, ongoing)
  - **ClusterFinder (HLT version to be checked)**



# Active half-staves vs time



... as yesterday -> Total : 96    Inner Layer : 28/40    Outer Layer : 68/80

Raw OCDB OK for all LHC periods

Only problem found with run119926 (1 more HS to be masked)



# Handling dead pixels for MC



- ❑ A procedure has been defined to determine “bad pixels” (= dead + inefficient)
- ❑ Checks on stability over LHC10 periods (b,c,d) ongoing
- ❑ Statistics needed → synchronization with MC productions
- ❑ Further remarks :
  - ***ITS/Calib/SPDDead*** object: both inactive HS and dead pixels
  - For MC: ***ITS/Calib/SPDNoisy*** contains dead pixels as found in December 2009
  - Introduction of a new OCDB object → to be discussed

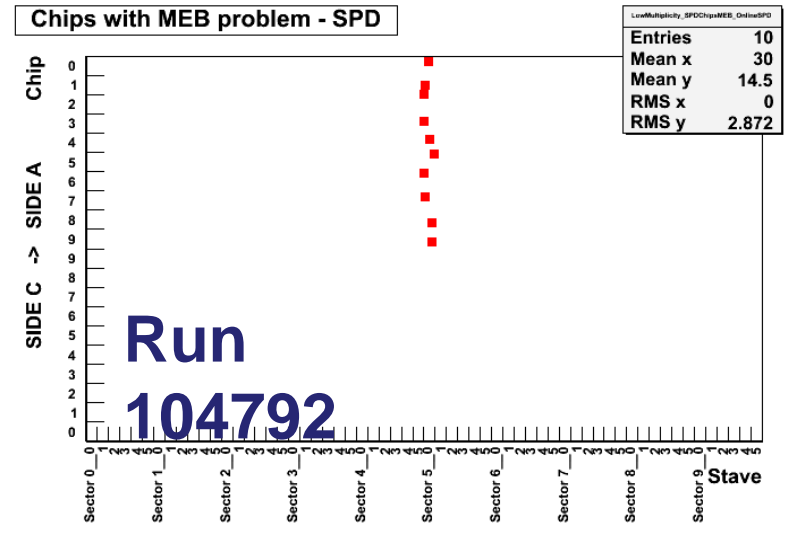
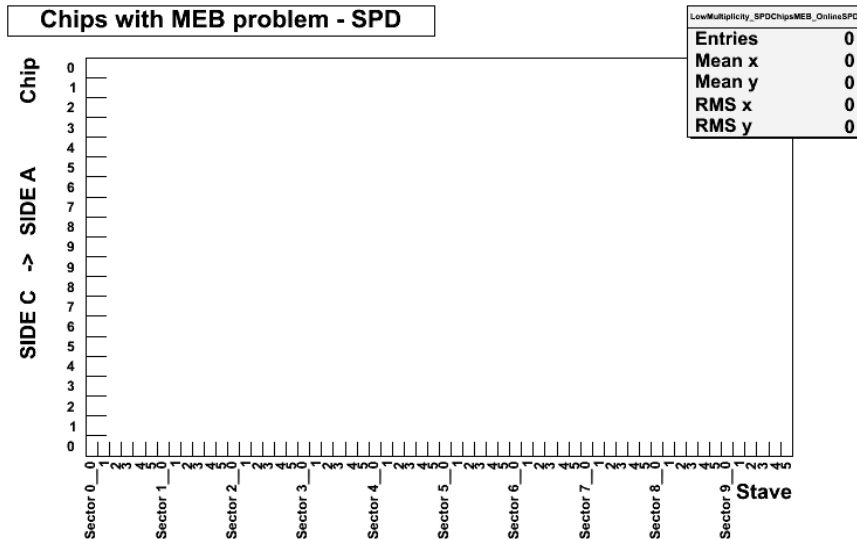
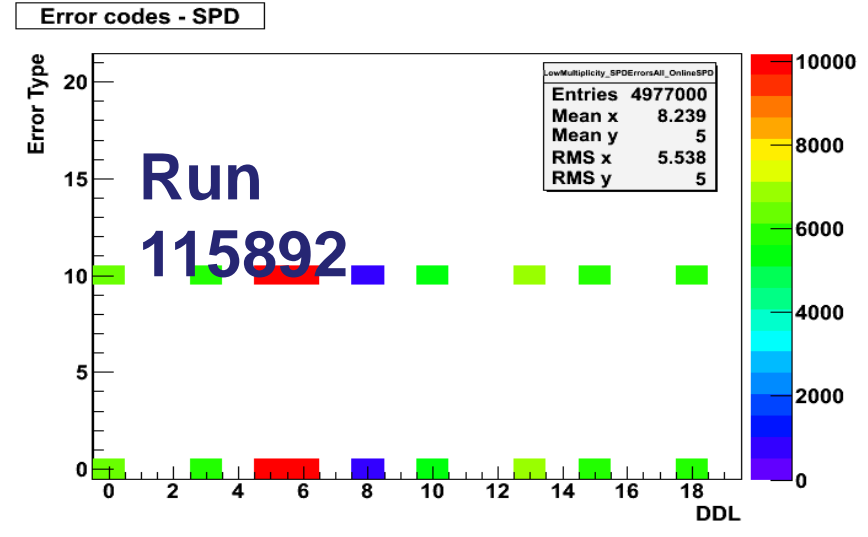
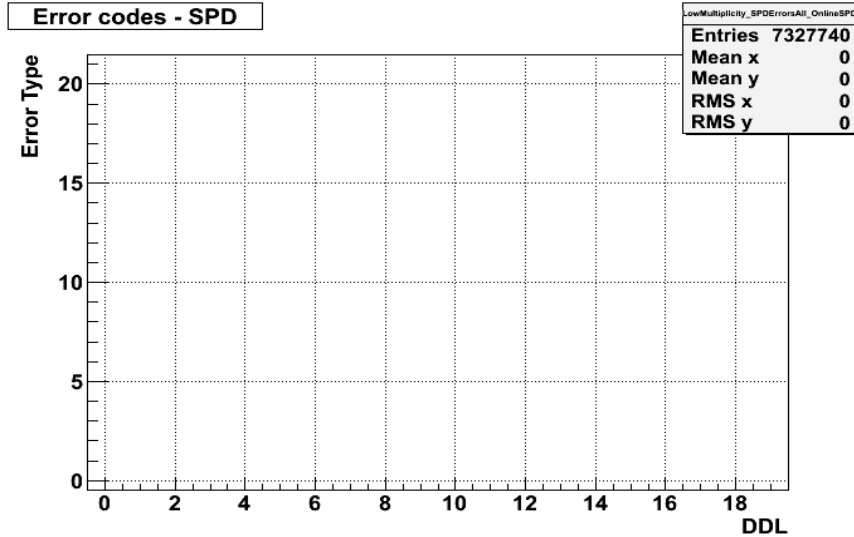


# DQM plots and Raw-QA checker

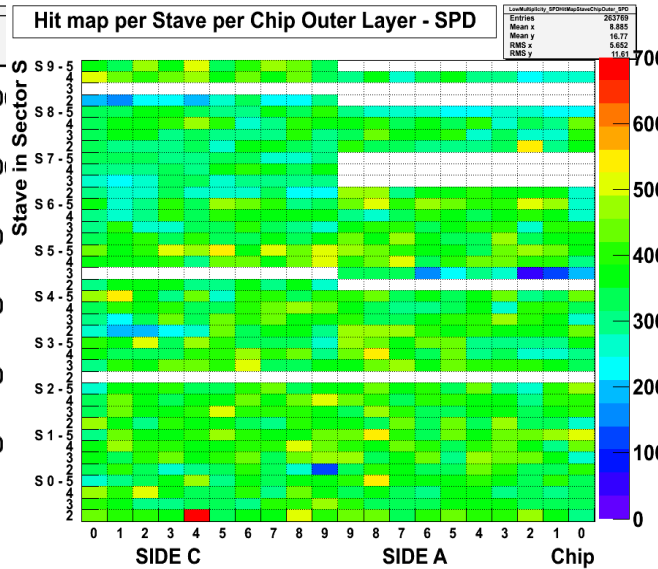
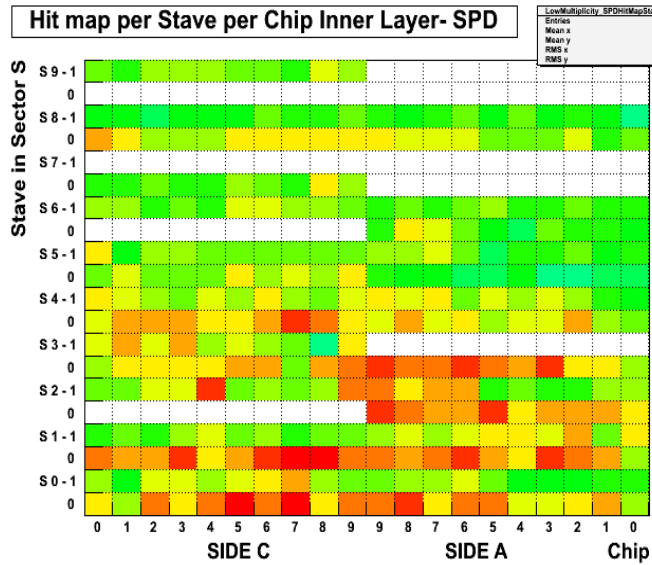


- Plot list:
  - Data format errors (20 error types per 20 Eq)
  - Chips showing MEB (1200 chips)
  - 2 Hitmaps (Inner and Outer layer)
  - FastOr bit map (1200 chips)
  - FastOr bit correlation (Inner vs Outer)
  
- Updated labels of the histograms:
  - [communication between DQM shifter and SPD experts]
  
- Offline QA Checker sets FATAL bit for RAW task:
  - at least one Data Format error occurs
  - at least one chip is suspected to show the MEB

# DQM plots: normal vs problematic



# DQM plots: maps

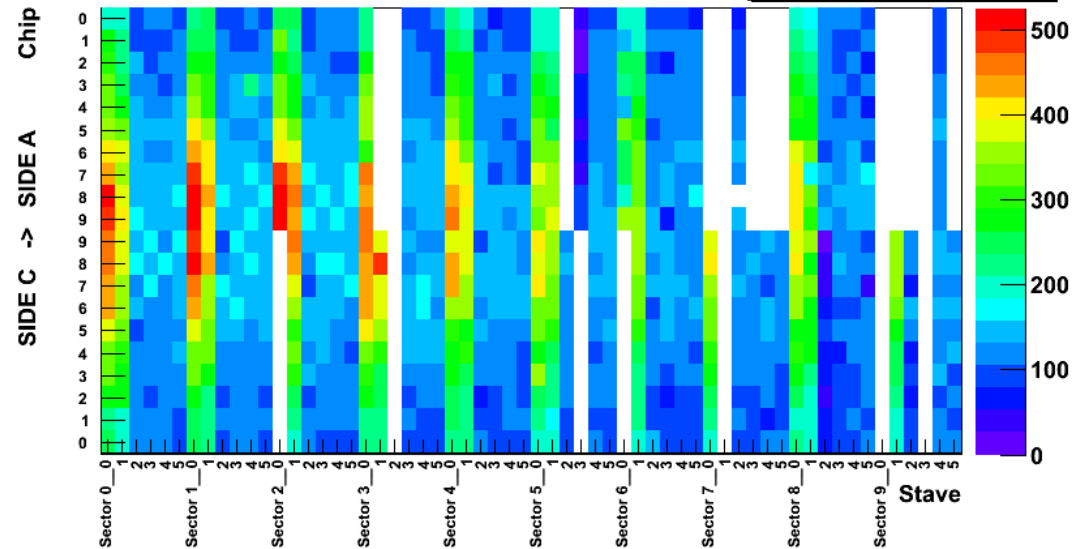


Hitmap

FO bit map

FastOr map per Stave per Chip - SPD

LowMultiplicity_SPDFastOrMapStaveChip_SPD	
Entries	179319



Feedback from  
DQM and ITS shifters  
taken into account!

# Geometry in the fwd region



## □ What was needed:

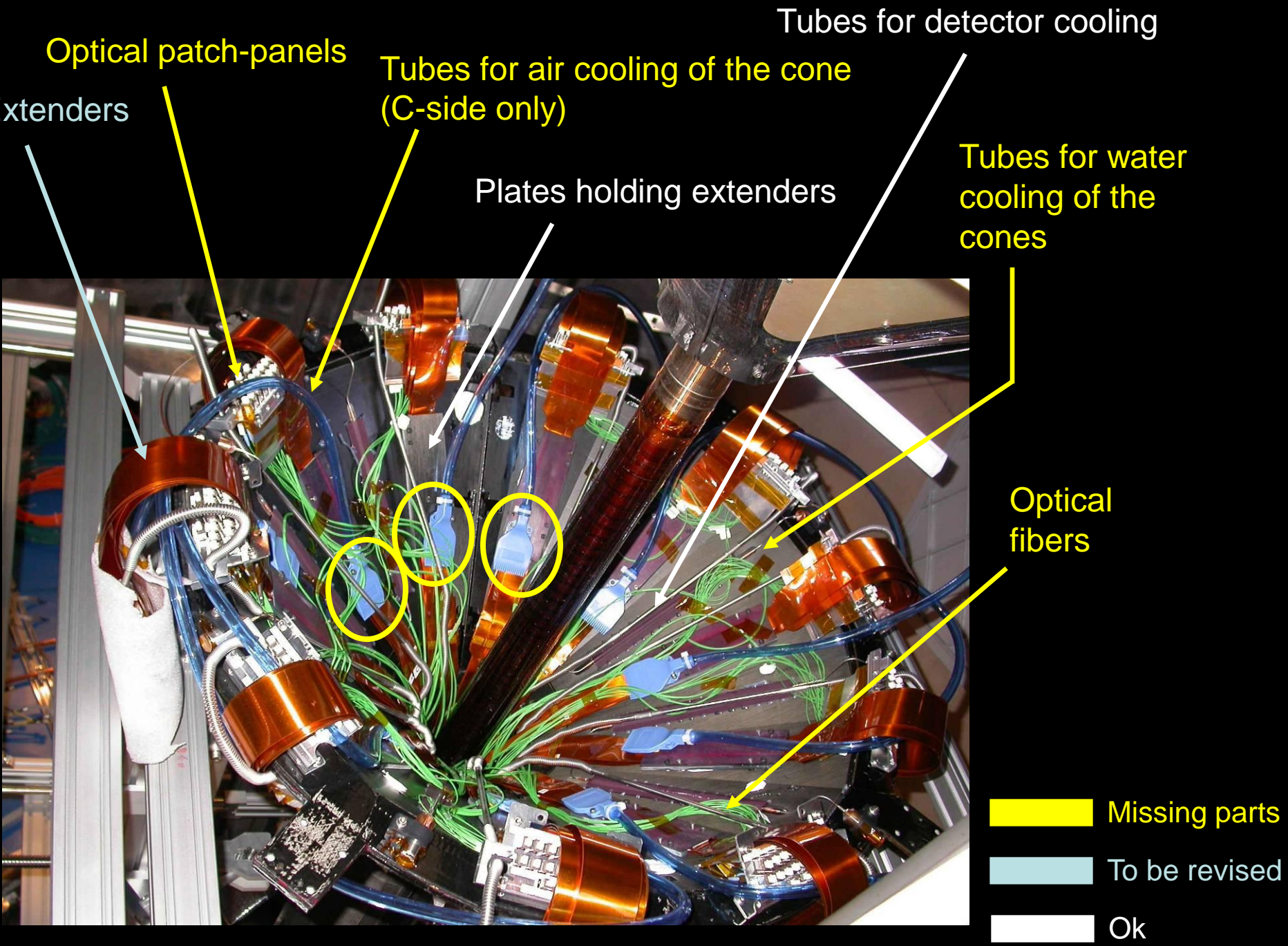
- improve description of cabling and services, mainly affecting the forward region ( $|\eta| > 1.5$ )
- triggered by inconsistencies found in the FMD data analysis (more background than expected from MC)

## □ Corresponding actions:

- detailed checks: drawings vs actual implementation
- few issues identified:
  - material to be revised / added
  - completely missing parts (mostly minor details)
- corresponding code implementation :
  - most of it (relevant parts) already done (Alberto and Mario)
  - committed to svn, available for tests
  - couple of last details will go in within this week







Optical patch-panels

Tubes for detector cooling

Extenders

Tubes for air cooling of the cone  
(C-side only)

Tubes for water  
cooling of the  
cones

Plates holding extenders

Optical  
fibers

- Missing parts
- To be revised
- Ok

Optical patch-panels

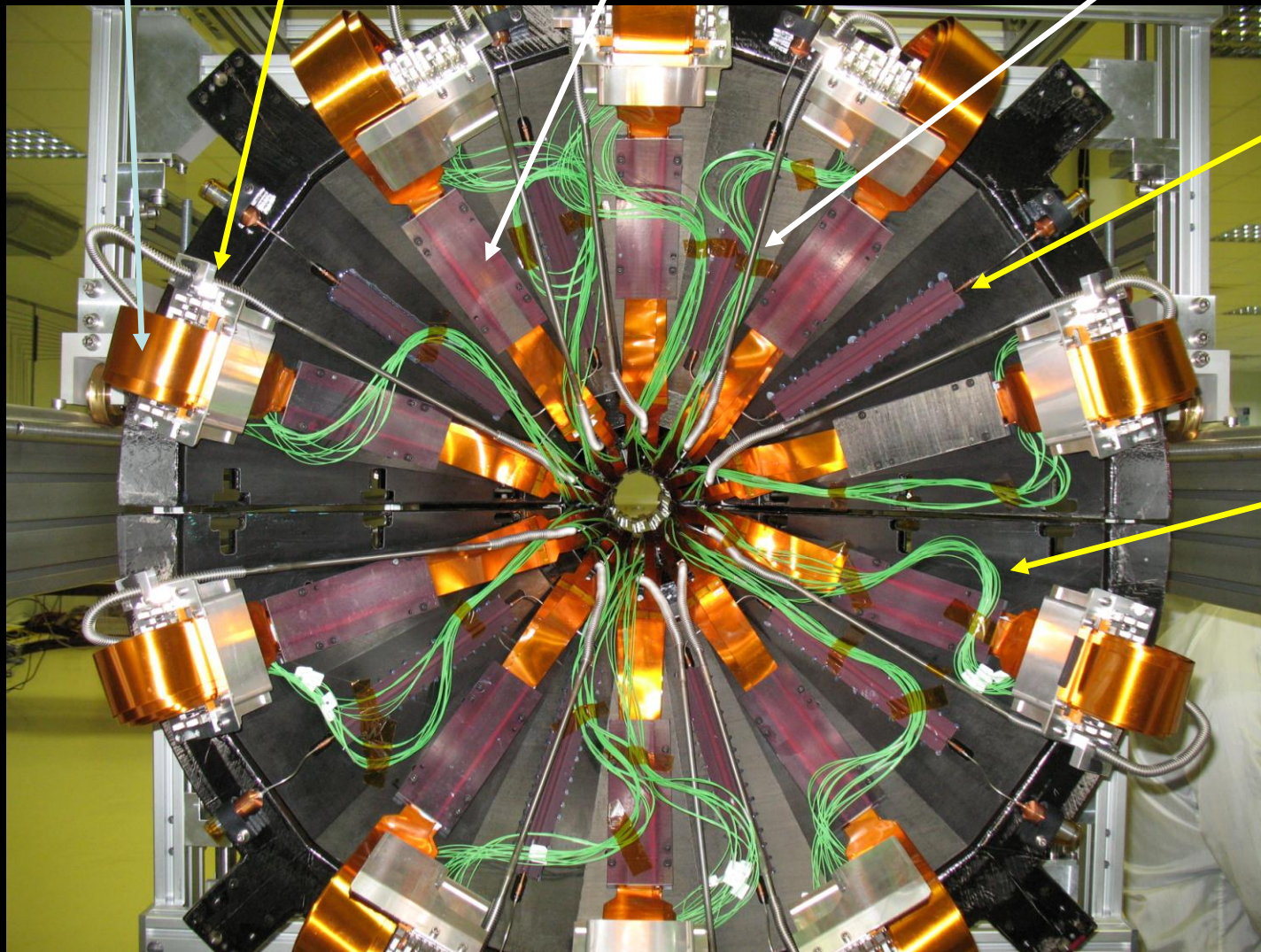
Tubes for detector cooling

Extenders

Plates holding extenders

Tubes for water cooling of the cones

Optical fibers

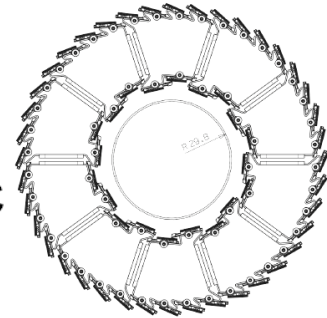


- Missing parts
- To be revised
- Ok

# Updates to sector geometry



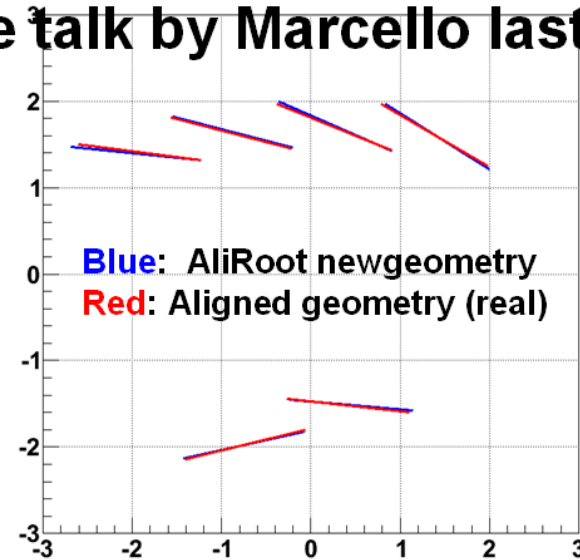
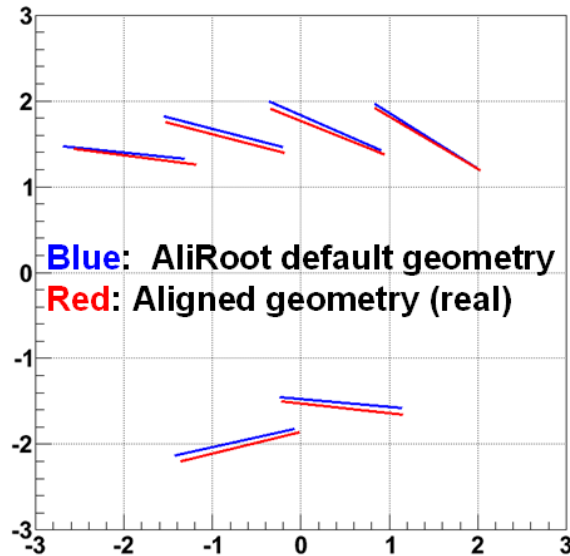
- ◆ Millepede alignment (with cosmics and pp) showed that the real (x,y) profile of the SPD support sectors differs slightly from the design
- ◆ Large shifts needed to align SPD
  - ◆ → TGeo overlaps → real alignment cannot be used in MC
  - ◆ → position of sensors and material different in data and MC
    - affects  $\phi$  distribution of tracklets and tracks
    - material corrections? fraction of tracks with 2 SPD points?
- ◆ Action: modify SPD “ideal” geometry to bring it closer to real (R.Grosso, M.Lunardon)
  - ◆ change shape of the sector transverse profiles (use 10 different shapes for the 10 SPD sectors)
  - ◆ change slightly the shape of the clips that hold the HS to the support
  - ◆ align sectors (relative positions) with Millepede and use the obtained positions for the new “ideal” geometry (for MC)
  - ◆ this setup has no TGeo overlaps (checked with 1  $\mu\text{m}$  precision)



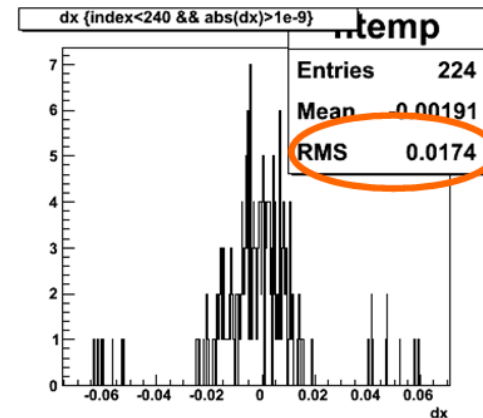
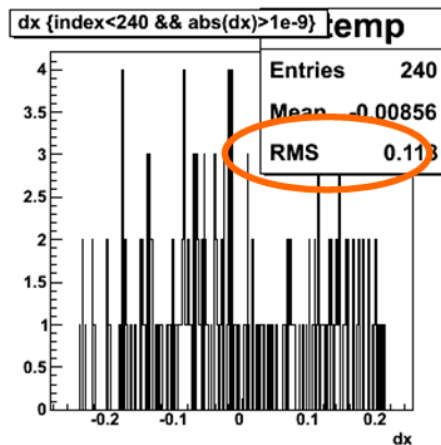
# New vs old sector geometry



→ see talk by Marcello last month



sensors alignment shifts (x)



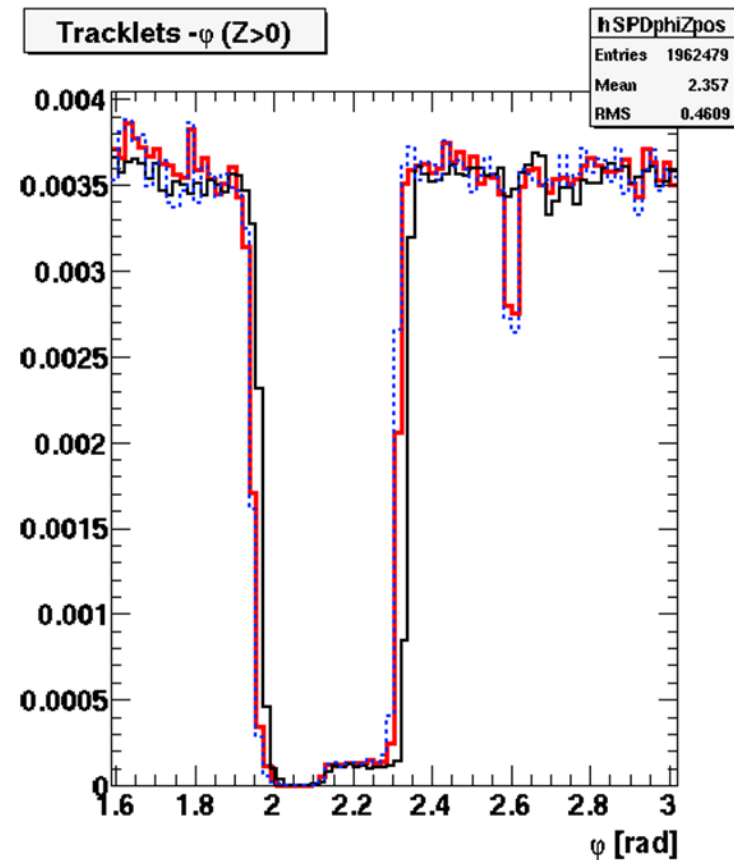
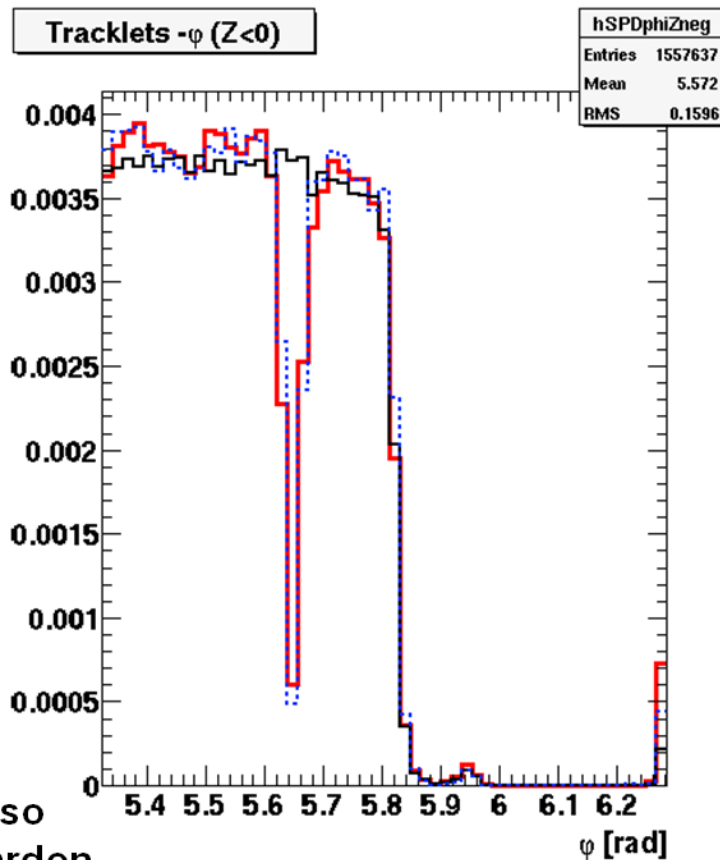
# Checks: SPD tracklets $dN/d\phi$



- ◆ Very sensitive to precise position of sensors

Run 114931

Data (pass2)  
LHC10b2 default geo  
Perugia0 new geo



R.Grosso  
M.Lunardon

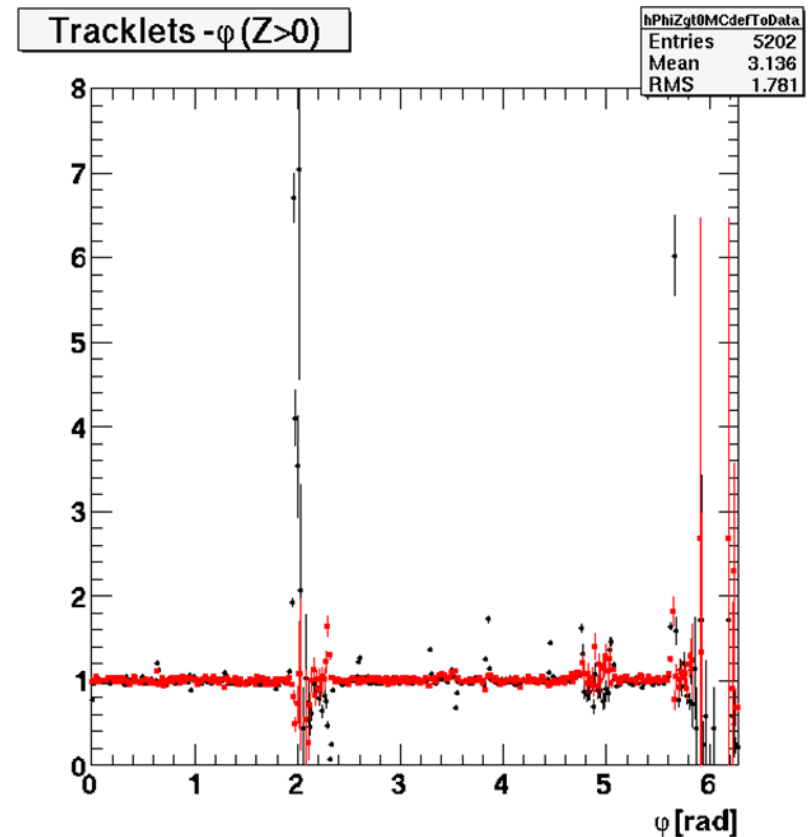
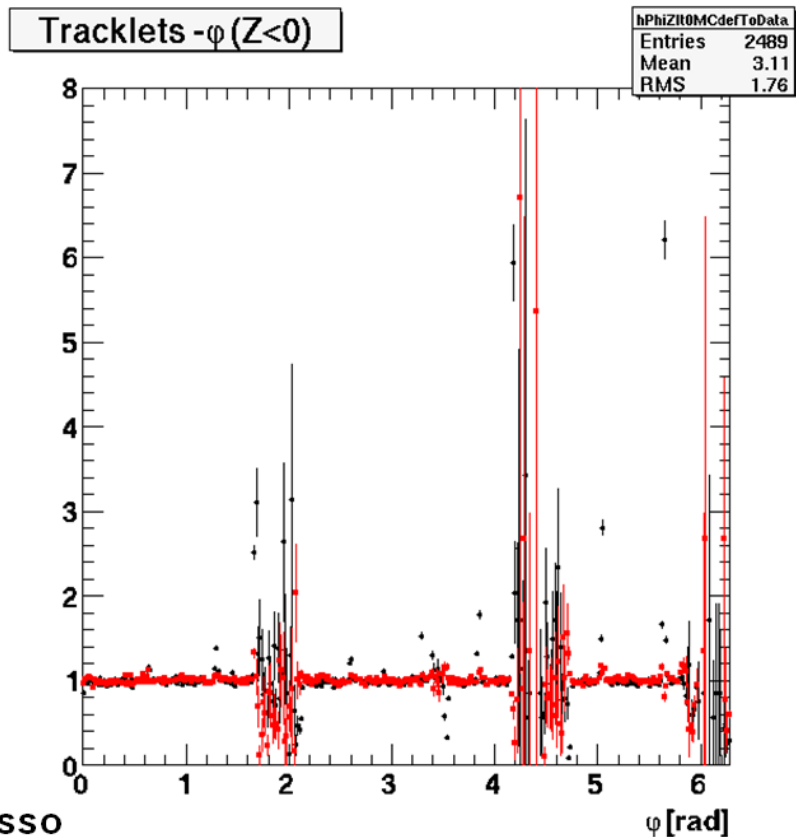
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Perugia0 new geo / Data (pass2)  
LHC10b2 default geo / Data (pass2)



R.Grosso  
M.Lunardon

# Technical aspects: AliRoot and MC OCDB



- ◆ The only modified class is AliITSv11GeometrySPD (cxx)
- ◆ The AliRoot and MC OCDB GRP/Geometry/Data has to be updated
- ◆ The MC OCDB object ITS/Align/Data has to be changed:
  - ⊕ AliRoot and alien MC Ideal OCDB:
    - current:
      - ITS global survey (+  $\Delta y=400 \mu\text{m}$  to match with MP geometry)
      - SSD survey
    - new:
      - ITS global survey (without the additional  $\Delta y$ ?)
      - SPD sector alignment (as obtain by Marcello with MP2)
      - SSD survey
      - SDD survey (modules only) to be added?
  - ⊕ alien MC Residual (Full) OCDB
    - same as Ideal + gaussian smearings (watch for overlaps)

# Technical aspects: raw:// OCDB



- ◆ The GRP/Geometry/Data has to be changed
- ◆ ITS/Align/Data:
  - ⊕ alignment corrections have to be “referred” to the new ideal geometry
  - ⊕ options (Ruben?):
    1. transform the existing AliTrackPoints to the new ideal geometry and rerun the alignment
    2. transform the current alignment objects to the new ideal geometry (looks more tricky...)



# Plan



- ◆ For MC and AliRoot, modifications are essentially ready
  - ⊕ only the Residual and Full smearings have to added
- ◆ For raw://, the “conversion” of the alignment file is needed
  
- ◆ Possible plan:
  - ⊕ prepare GRP/Geometry/Data and ITS/Align/Data
  - ⊕ validate them with private reconstruction of a run (end July)
    - check tracking efficiency and d0 resolution
  - ⊕ commit to trunk and Release the changes
  - ⊕ update alien OCDB objects when new AliRoot Rev enters production
- ◆ Aim for end of July?