

# SSD STATUS REPORT

*ALICE OFFLINE WEEK*

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# Outlook on the SSD software

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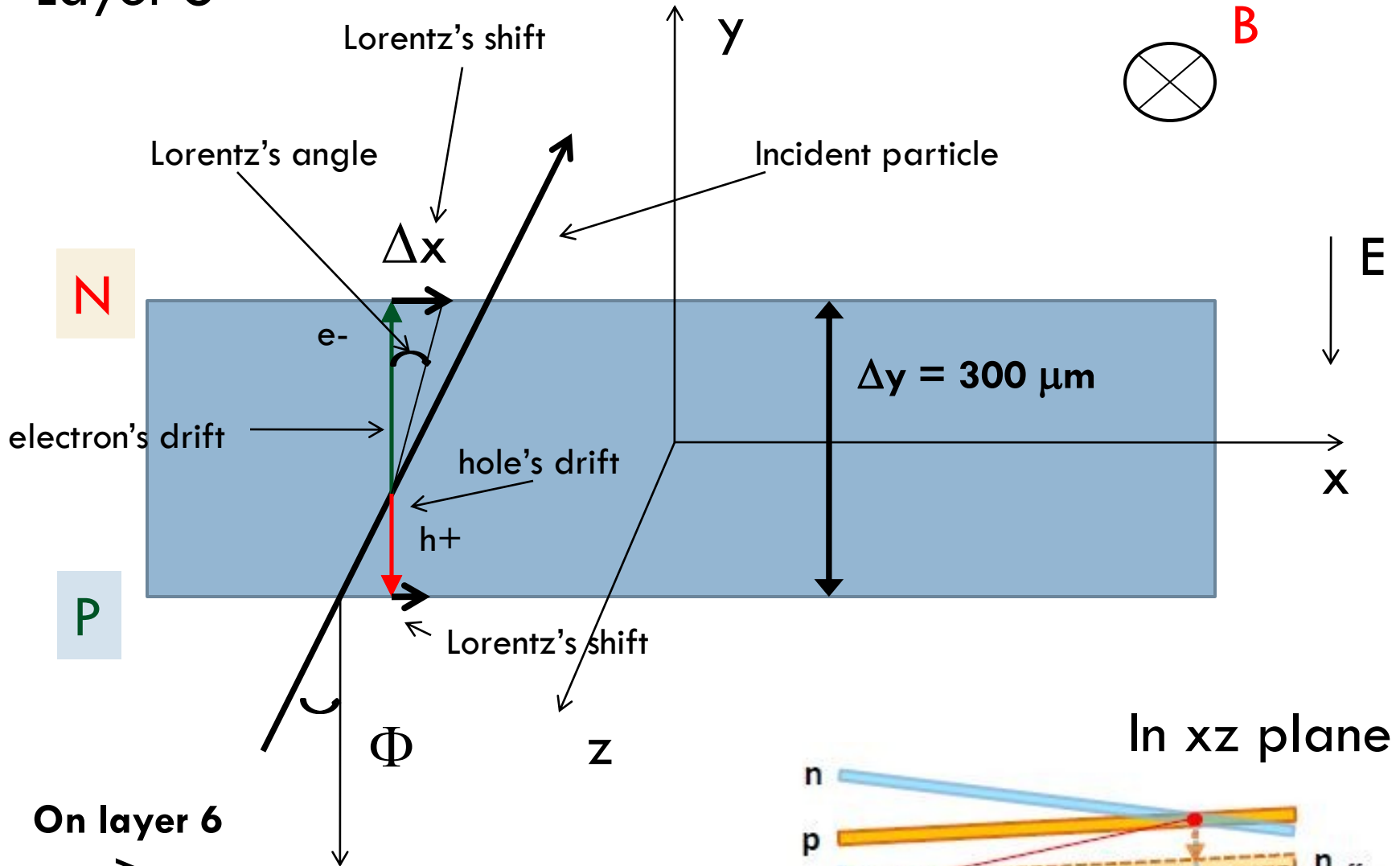
- **No major modifications** to the SSD code in the past couple of months, **except** for the correction for the Lorentz's angle (Savannah's [bug #74658](#) see next slides)
- Reworked cluster finder for speed performances improvements (Savannah's [bug #60032](#)) (Sasha B.)
- Update of the GainSSD in OCDB for pass2 of 7TeV (Savannah's [bug #66686](#)) (Marco vL., Marek C.)
- AliSimulation::Raw2SDigit for ITS has huge memory leak (and crashes) (Savannah's [bug #70587](#))
- Ongoing discussion on cluster unfolding (Marco vL., EF)
- Solving [coverity](#) defects [work in progress](#) (EF,...)

# Lorentz's effect in the SSD

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- Due to the effect of the Lorentz's force on the carriers in the silicon
- Charge carriers shifted in local  $x$  (see sketch next slide)
- Affects cluster size vs  $\phi$  of incident tracks (see later)
- Due to the stereo angles, a non-negligible shift in  $z$  ( $220 \mu\text{m}$ ) is also foreseen (see Ruben S., PWG1 08-11-2010)

# Layer 5



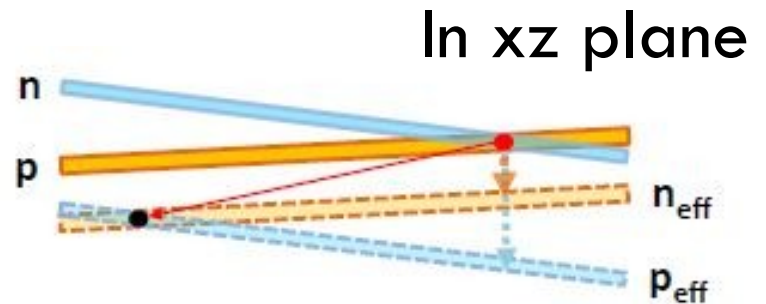
**On layer 6**

$y \rightarrow -y$

$E \rightarrow -E$

$B \rightarrow B$

$\Delta x \rightarrow \Delta x$

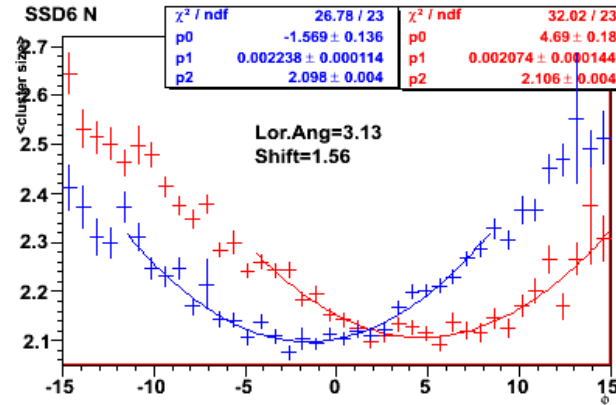
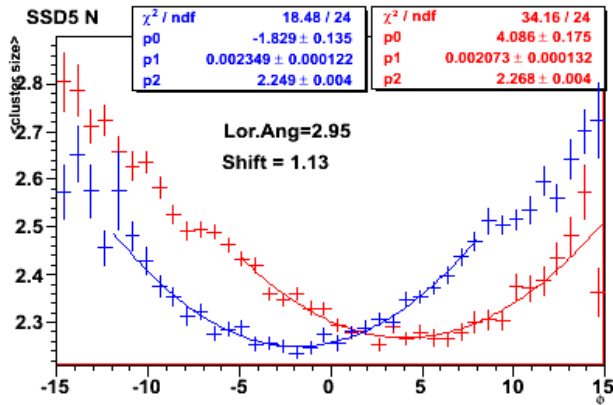


Estimates (Mikolaj): LA  $\sim 4.5^\circ$  for electrons and  $\sim 1.5^\circ$  for holes  $Z \sim 230 \mu\text{m}$

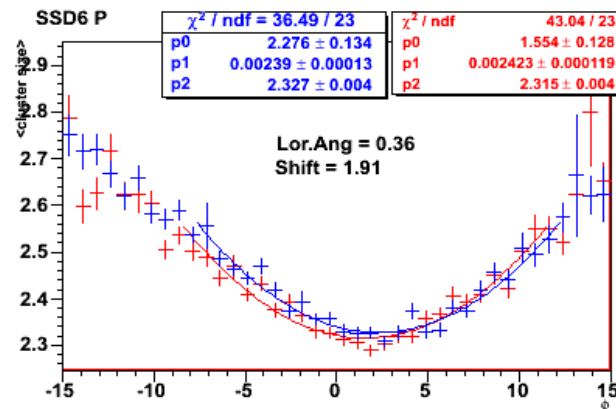
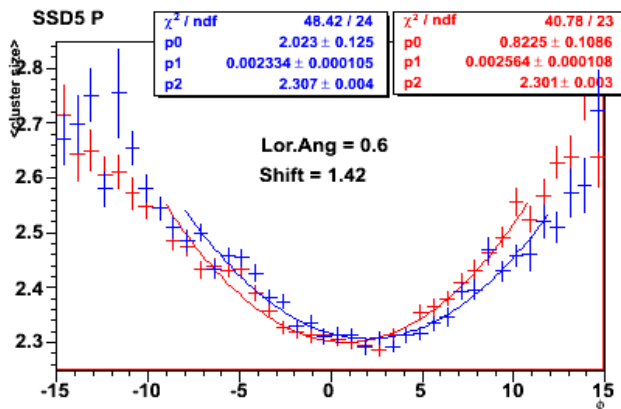
# Effect on cluster size vs phi

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**B>0 run 120822 (~150k events)**  
**B<0 run 130850 (~150k events)**



**B<0 B>0**



Private reconstruction  
(need RecPoints) of ITS only

**Ruben S. , PWG1, 08-11-2010**

# bug #74658: Correction for the Lorentz drift

Marco vL, Giuseppe B., E.F.

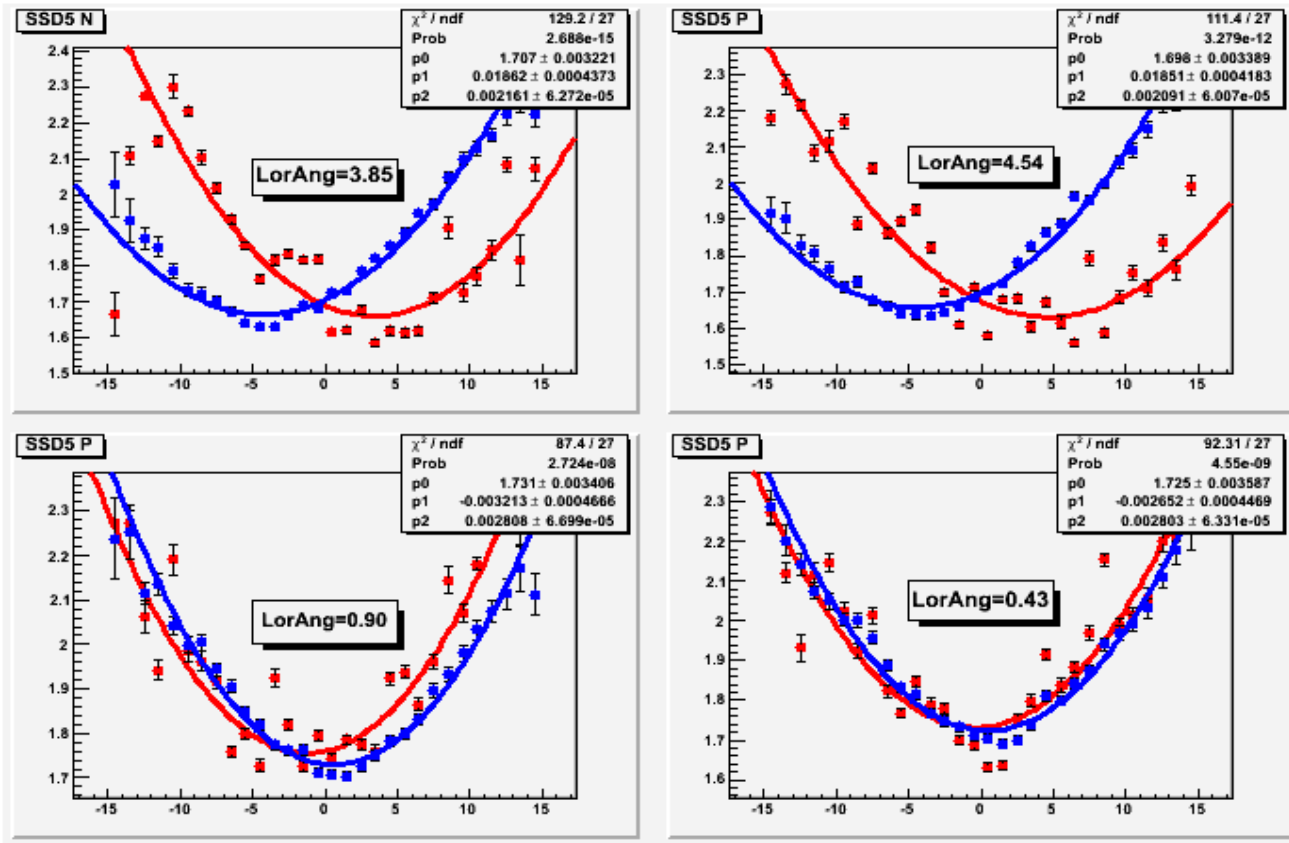
6

- AliRoot Classes **AliITSSimulationSSD** (EF) and **AliITSClusterFinderV2SSD** (Marco vL) have been modified
- AliITSSimuParam (Bool\_t fSSD LorentzDrift(kTRUE)) and AliITSRecoParam (fCorrectLorentzAngleSSD(kTRUE), fTanLorentzAngleHolesSSD(0.016), fTanLorentzAngleElectronsSSD(0.068)) changed accordingly to steer the correction
- Revs 44875 and 44941 (03-11-2010). To be ported to the release
- **In the simulation** the x coordinate of the carriers is shifted according to the Lorentz's force.
- Makes use of the algorithm implemented in AliITSSimuParam by Giuseppe B. for the SPD (ref. "An algorithm for calculating the Lorentz angle in silicon detectors", V. Bartsch et al. NIM A 497 (2003) 389-396)
- **In the reconstruction** the position of the 1Dcluster on each side is shifted to correct for the Lorentz's shift of the carriers.

# Simulation of the Lorentz's angle

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Enrico F.



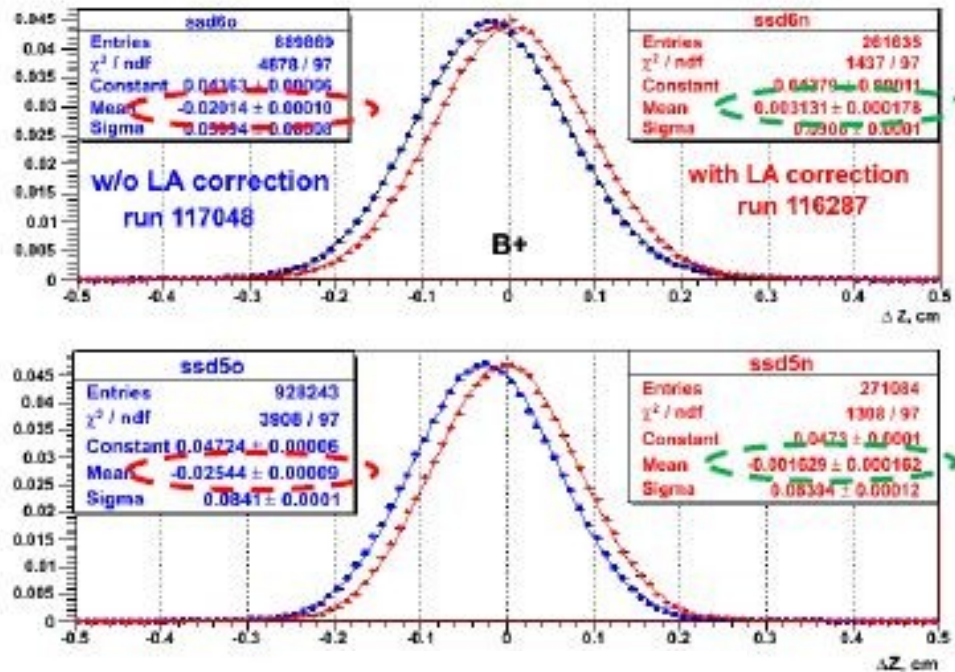
**B>0 (5000 events)**  
**B<0 (5000 events)**

**Will not be able to see here the effect of the correction factor in the reconstruction!**

Private ppbench sim/rec (ITS only)

# Correction in the reconstruction

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SSD local z residuals

Ruben S. , PWG1, 08-11-2010



# bug #60032: reworked SSD clusterfinder

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- ❑ **Revised SSD cluster finder** (O.Borysov) from rev. 42508 (23-07-2010)
- ❑ The method FindClustersSSD(AliITSRawStreamSSD\* input) was changed on the basis of the HLT CF to eliminate the processing of those strips which were suppressed in FEE.
- ❑ Improvement of a factor 4-5 in the performances (speed) of the new cluster finder 😊
- ❑ **200 events** from pp data (from file 10000115511019.10.root) have been analyzed with **both the old, the new and the HLT cluster finder** producing exactly the same results in the reconstructed points 😊

# Revision of the CF: minor changes

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- 2047 in place of 4095 in AliTSDDLRawData and AlITSimulationSSD
- signal was declared as Float\_t;
- comparison with  $5 * \text{noise}$  was moved before gain correction;
- type casting for signal to integer were removed

# Coverity defects

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**15/45 defects** related to SSD have been solved

The remaining defects have been notified to whom concerns

ALIROOT Class	Defect #	Reason of the defect
AliITSRawStreamSSD	10063, 10180	indexes out of range
AliITSTableSSD	13345	scalar field not initialized
AliITScLusterSSD	13346-13348	scalar field not initialized
AliITSHandleSSD	15732	strcpy
AliITSv11GeometrySSD	15786,15799-157805	sprintf