



Check of LA in BPIX



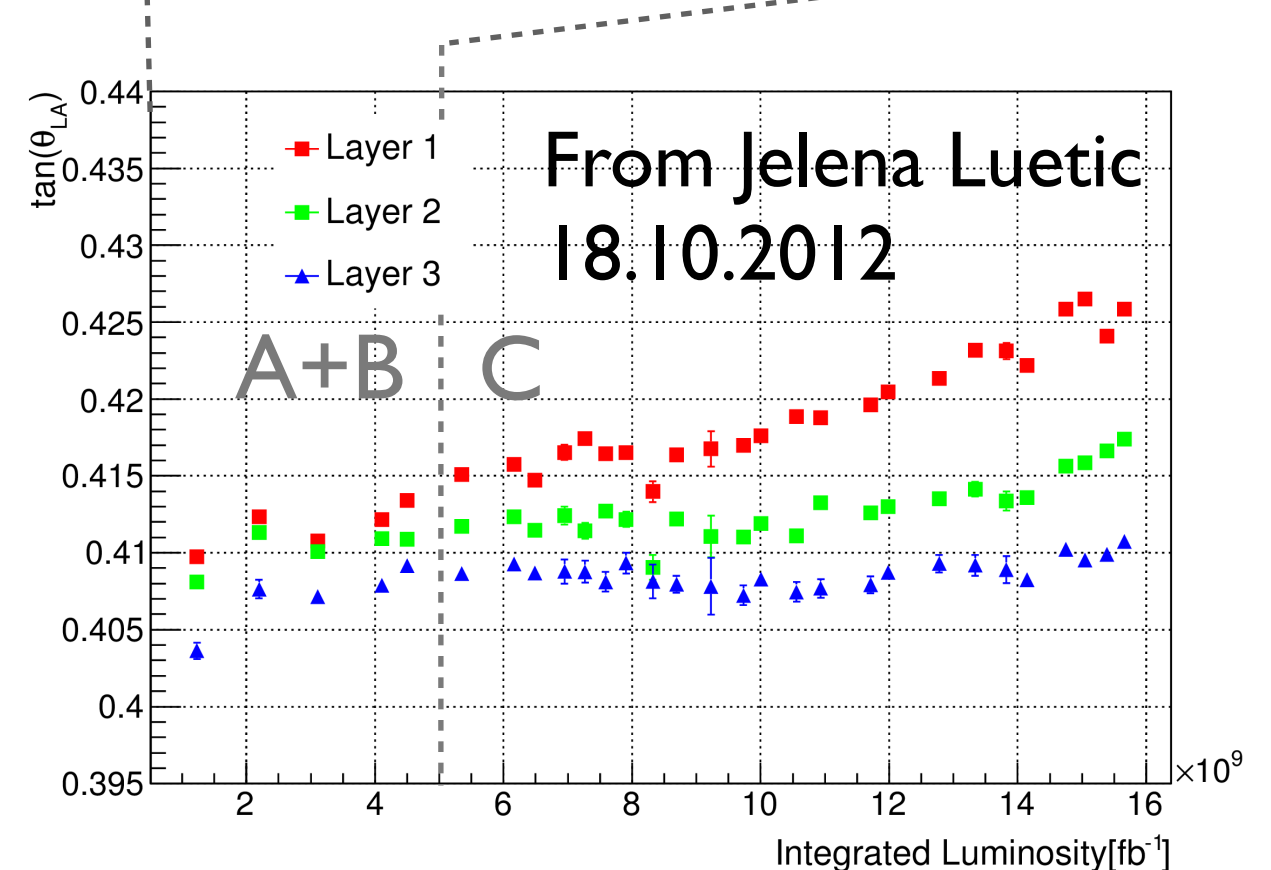
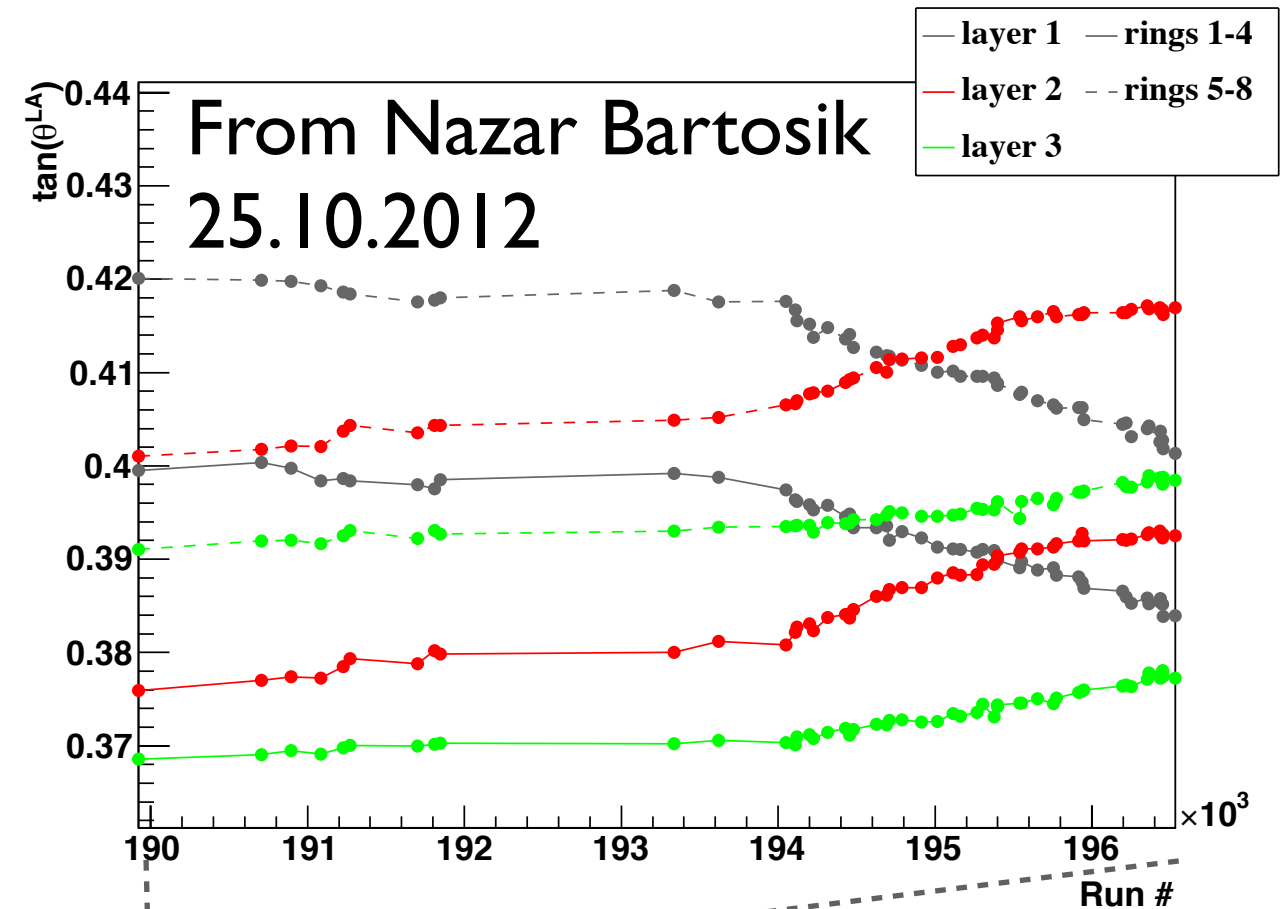
(Using MillePede track based alignment)

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Introduction

- Discrepancies were found in time dependence of LA in BPIX between results from Pixel group and from track-based alignment.
- LA in 1-st layer changes with time differently in results from 2 methods;
- Difference between layers is significantly larger in results from track-based alignment;
- First thing to check is the correctness of parameterization of signal shift due to LA effect in the code for all layers of BPIX.

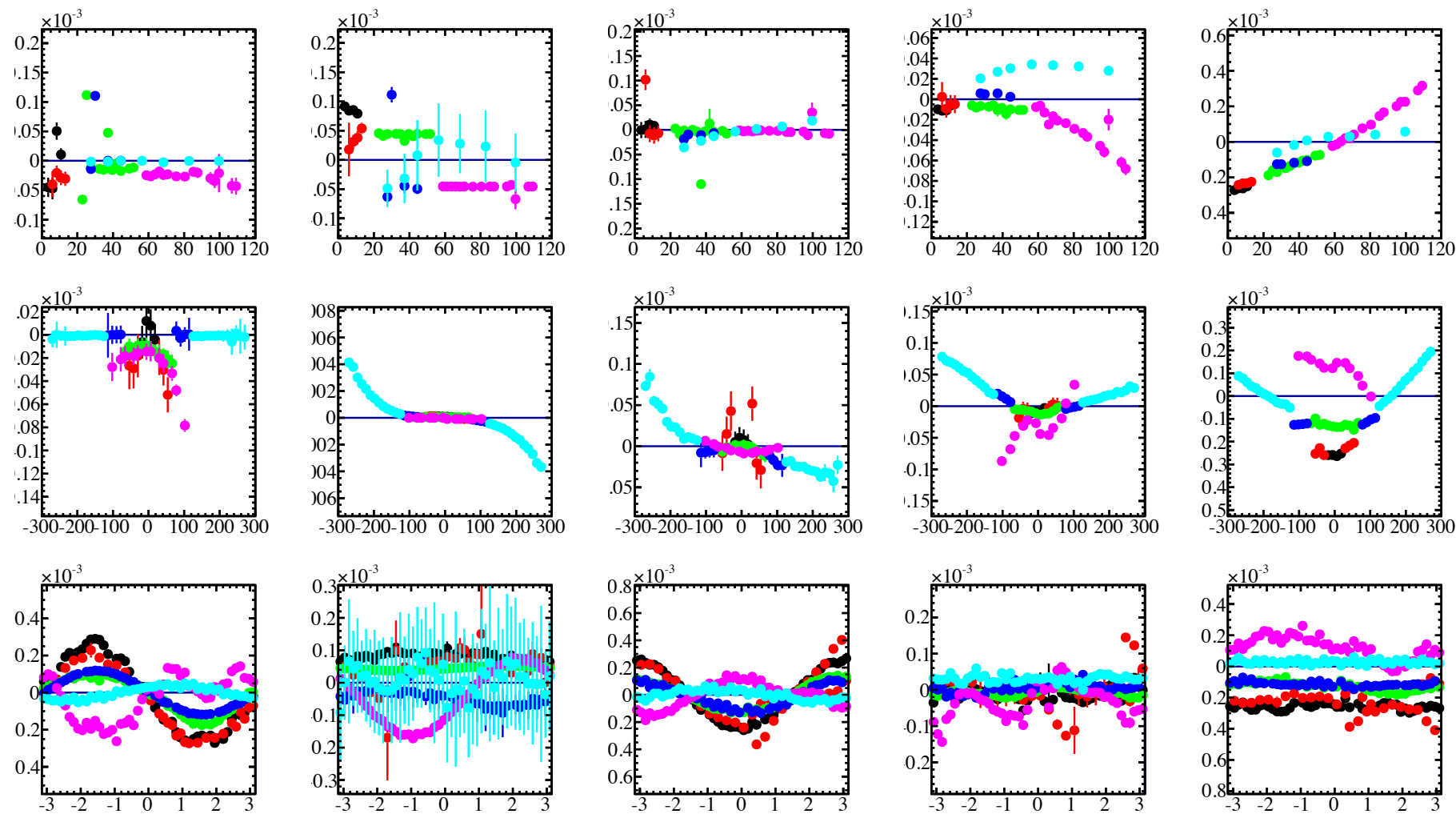


Description of testing method

- Latest results from MillePede are stored in alignment mp1253;
 - Time dependence: 58 IOVs ($\sim 100 \text{ pb}^{-1}$ each);
 - Module granularity: 3 layers x 2 Z-halves = 6 parameters/IOV;
- Mobility values are stored in geometry sqlite file under the tag: SiPixelLorentzAngle;
- This geometry was copied and all mobility values in it were increased by 0.02, which is:
 - $\sim 20\%$ of mobility from database corrected with MillePede;
 - $\sim 140\%$ of mobility correction from MillePede;
- New alignment was run with the same setup as in mp1253 but using input mobility values from modified geometry (1-st IOV).
- Aligned geometry (mp1266) is expected to have the same mobility values and corrections from MillePede should be -0.02.

Results of alignment

Geometry comparison of original mp1253 and mp1266 (with modified input mobility):

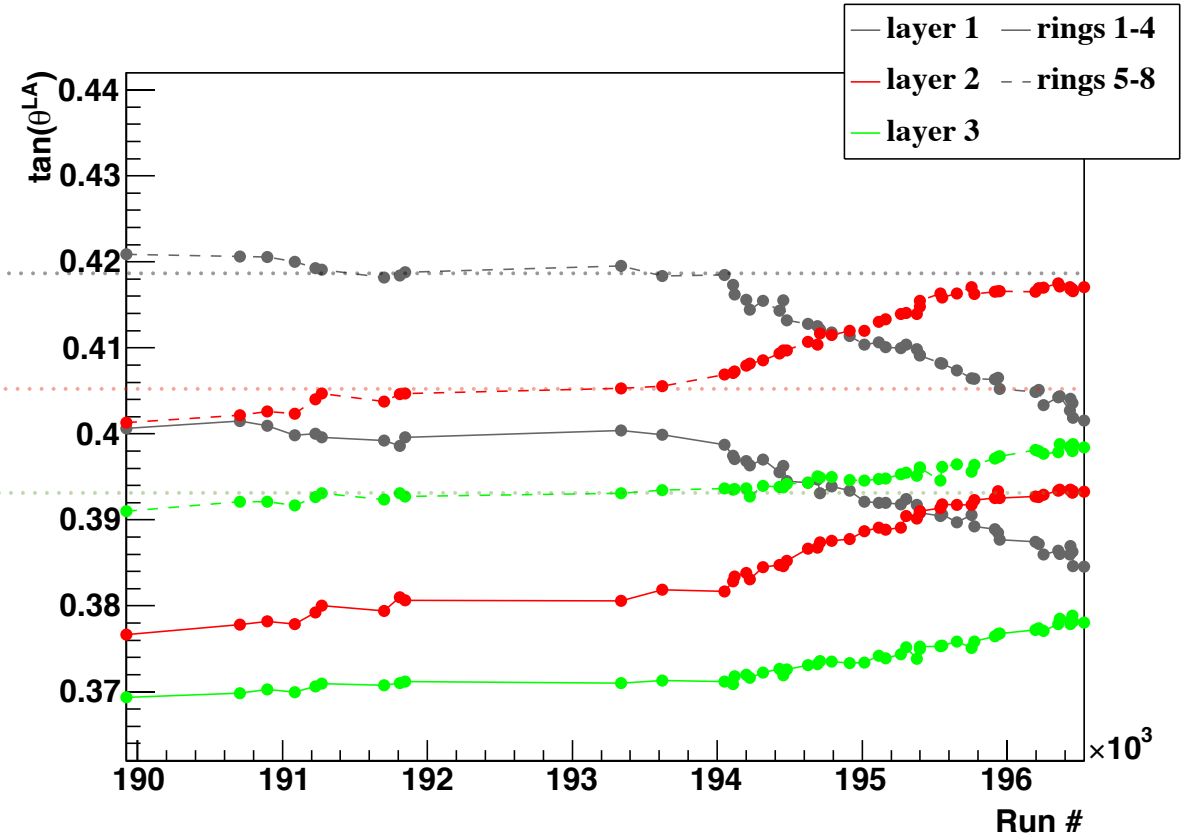
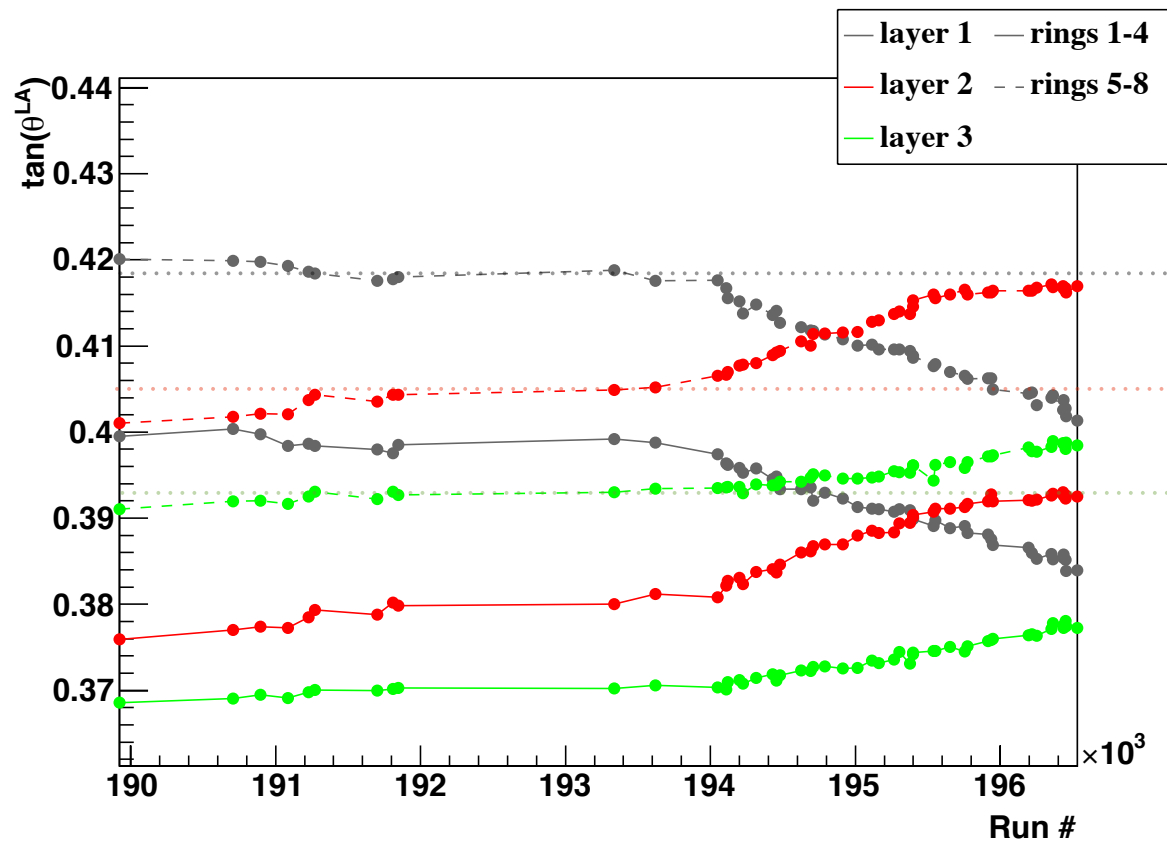


Corrections from MillePede in test alignment:

IOV 1	IOV 2	IOV 3
-0.019696	-0.01985	-0.019865
-0.019778	-0.019499	-0.019393
-0.019805	-0.0197	-0.019583
-0.019914	-0.019661	-0.019549
-0.019791	-0.019735	-0.019735
-0.020013	-0.019609	-0.019909

Minor difference between geometries.
Corrections from MillePede are all about -0.02, as expected.

Results of alignment



Original alignment: mp l 253

Test alignment: mp l 266

Final corrected mobility values are exactly the same between two alignments.

This proves that there is no wrong sign or multiplication factor in derivatives for all layers of BPIX.