Pixel LA time dependence

(Using MillePede track based alignment)

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Alignment setup: mp1268

Based on mp1193 baseline alignment presented by Jörg on Tracker Alignment Week:

- Full scale alignment starting from CRAFT12;
- 2012 A+B data used in alignment (original from mp1193):
  MinimumBias, SingleMu, peak Cosmics (interfill + CRAFT12), DoubleMu, MuOnia
- + CRUZET 0T Cosmics,
- + 2012 C+D data: SingleMu, MinBias, DoubleMu
- No Kinks&Bows alignment due to technical problems;
- Alignables: Large Structures, PixelModules: 111111
  TIB,TOB,TID,TEC Modules: 101111

Calibration setup: mp1268

- SiPixelLorentzAngleCalibration class used, with extended granularity and added (hard coded) time dependence;
- BPIX granularity:

  6 parameters: 3 layers x 2 Z-halves (rings 1-4, 5-8)
- Time granularity:

  119 IOVs : ~100 pb^{-1} per IOV
- Plus 2 parameters for FPIX (left, right side);
- Plus 1 alignment parameter per TIB, TOB,
- "WithTrackAngle" model used for final track refitting;
- Pixel template tag: "SiPixelTemplateDBObject_38T_v4_mc"

Alignment setup: mp1271

- The same setup as in mp1268 from previous slide;
- mp1268 used as starting geometry;
- Alignables: Large Structures, PixelModules: 111111
- Pede job run in "inversion" mode to derive errors of alignment parameters;

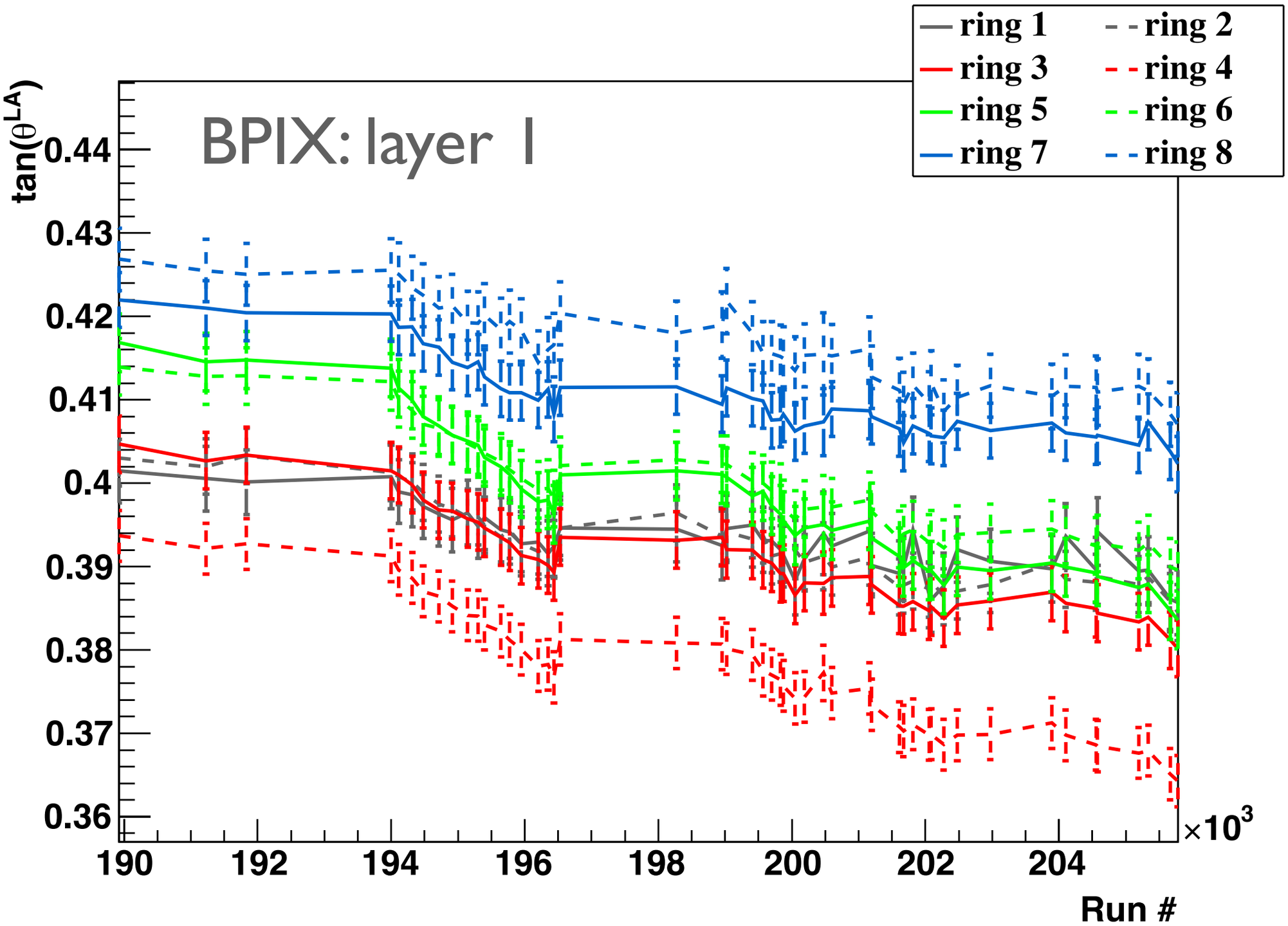
Calibration setup: mp1271

- The same setup as in mp1268 except:
- BPIX granularity:

  24 parameters: 3 layers x 8 rings
- Time granularity:

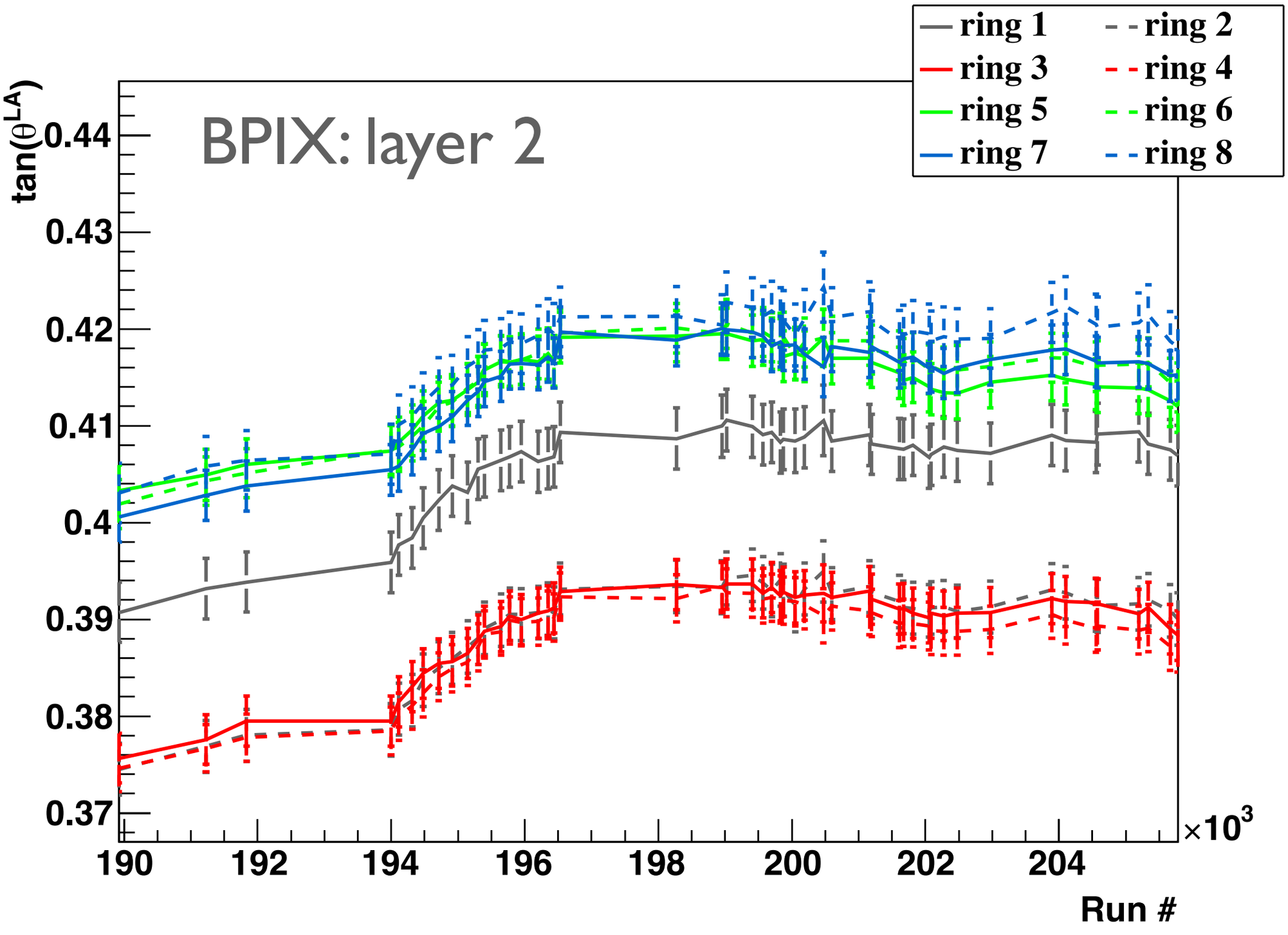
  49 IOVs : ~300 pb^{-1} per IOV

LA time dependence: BPIX



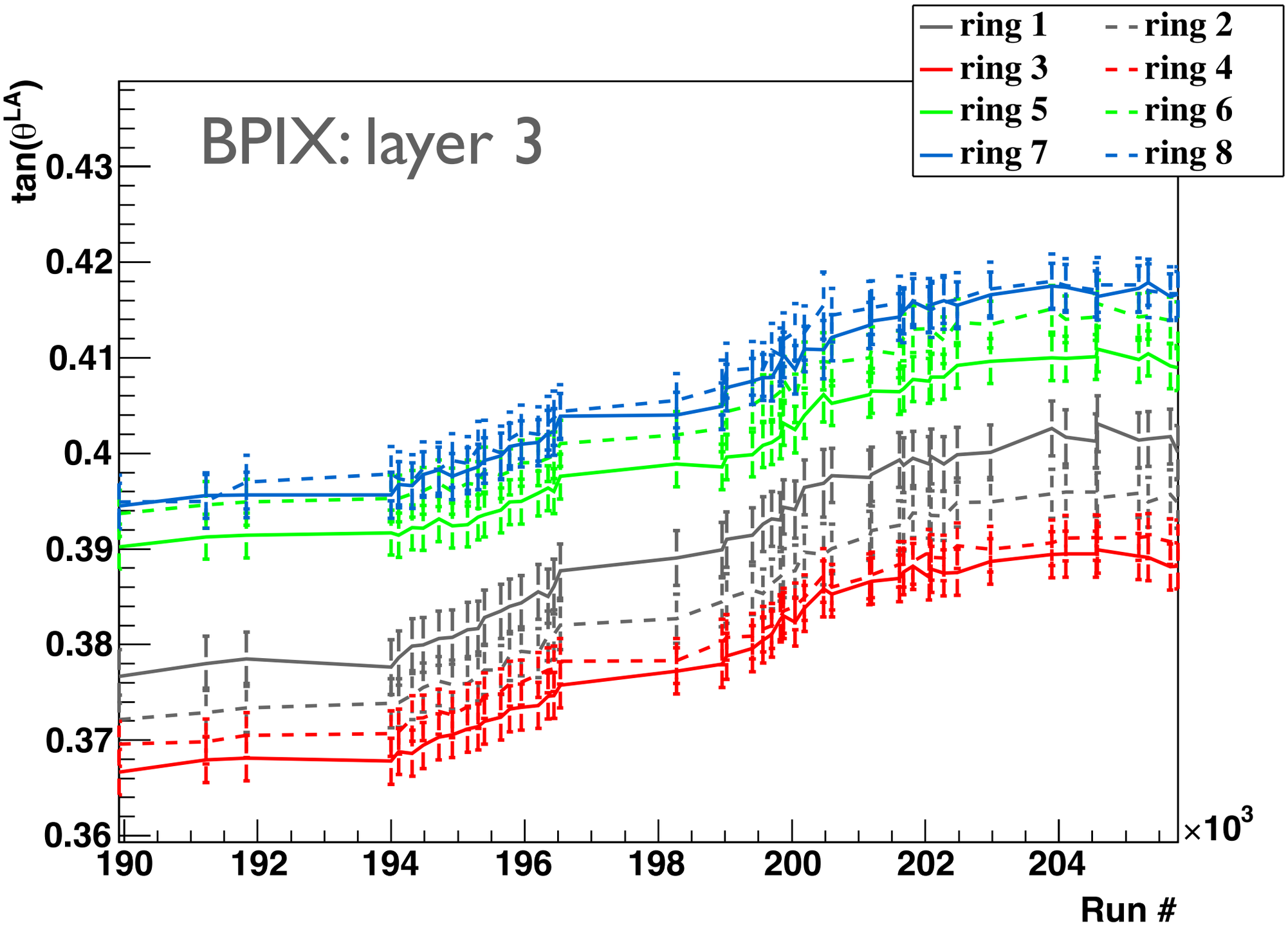
No clear seperation between negative and positive Z-halves.

LA time dependence: BPIX



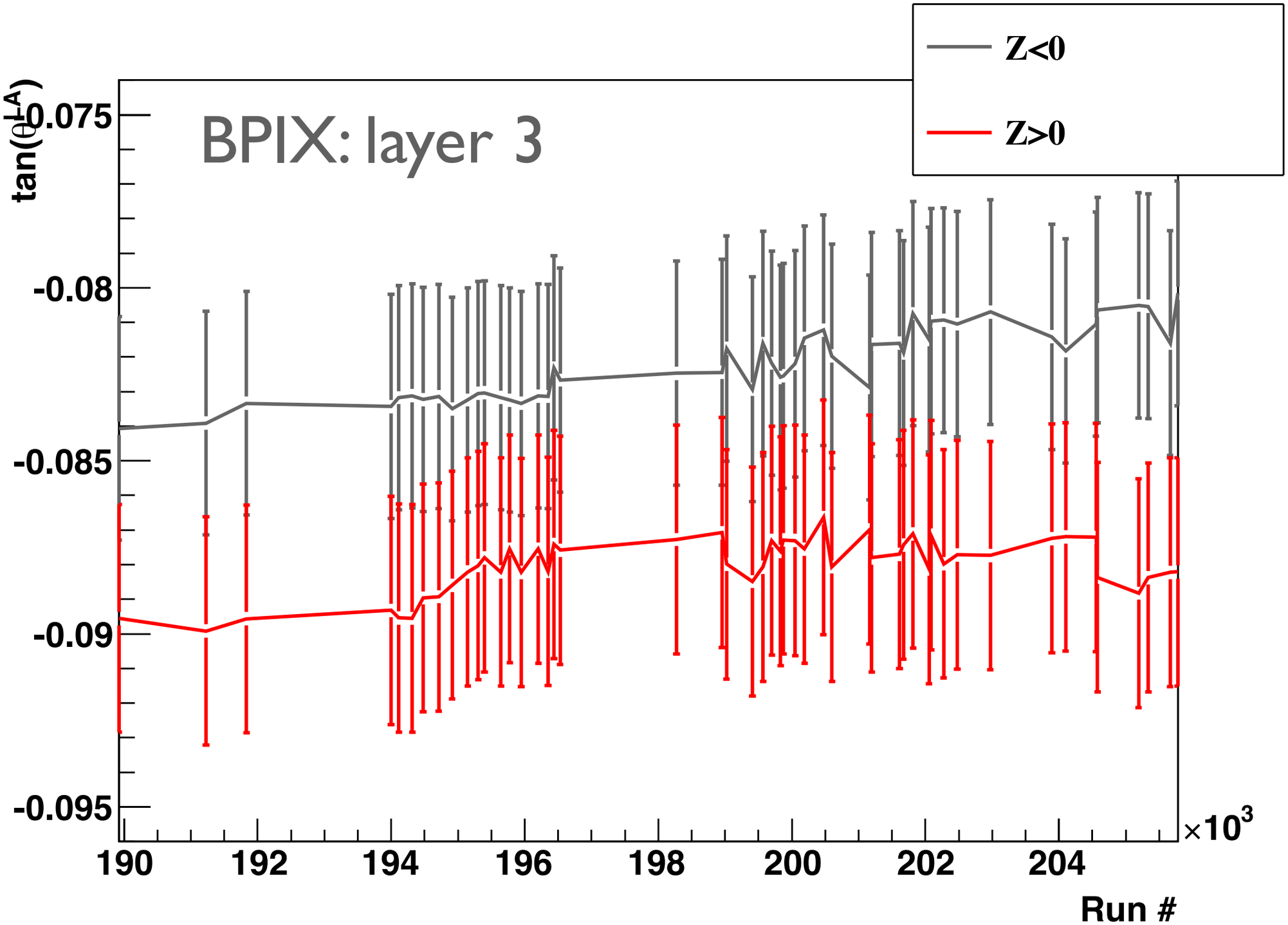
Layer 1 is far from rest layers in negative Z half.

LA time dependence: BPIX



Better separation between layers 1-4 and 5-8.

LA time dependence: FPIX



Errors are to large for defining the tome dpendence, but the mean values are different.

Conclusions

- Errors of corrections to LA have been derived using MillePede.

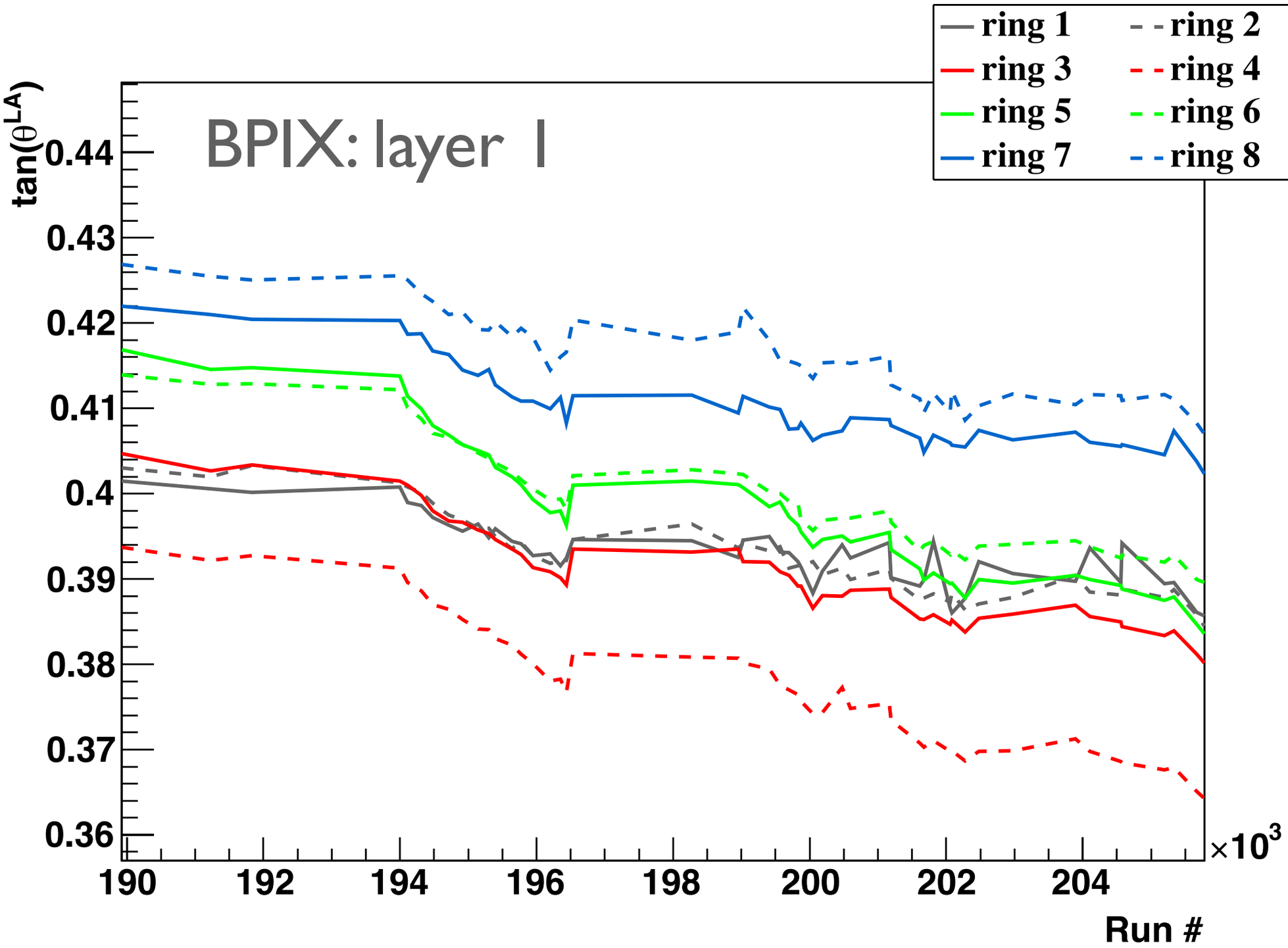
- Ring by ring and layer by layer dependence in BPIX is clearly seen.

- Dividing BPIX only in 2 parts aling Z doesn't seem to be sufficient.

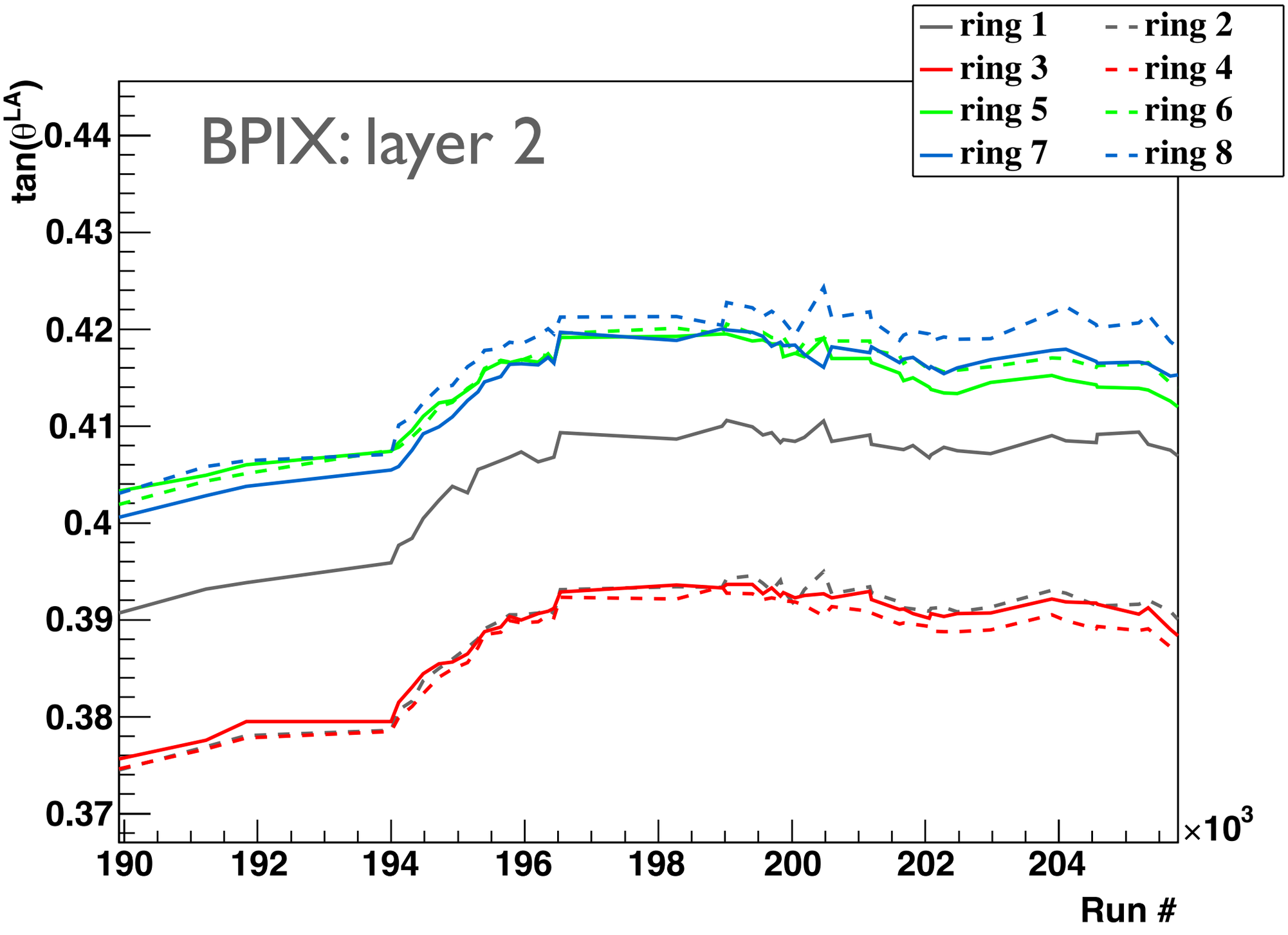
- Precision in FPIX is too low for measuring the time dependence, but the mean value between two sides of FPIX are different.

Backup

LA time dependence: BPIX (No errors)



LA time dependence: BPIX (No errors)



LA time dependence: BPIX (No errors)