

# Beamspot

Per Hansson Adrian 10/13/2015

# Introduction

Use MP to suggest corrections to beamspot position as well as sensors

- Top and bottom separately -> should converge to same position
- Proxy for external constraint; would like to minimize global difference in top vs bottom

Beamspot width, height and tilt included

- 30mrad detector rotation not included
- Place beamspot hits at (0.1,0,0); 100um was left unintentionally)

Had to blow up scattering angle to avoid error in GBL fit (positive definiteness).

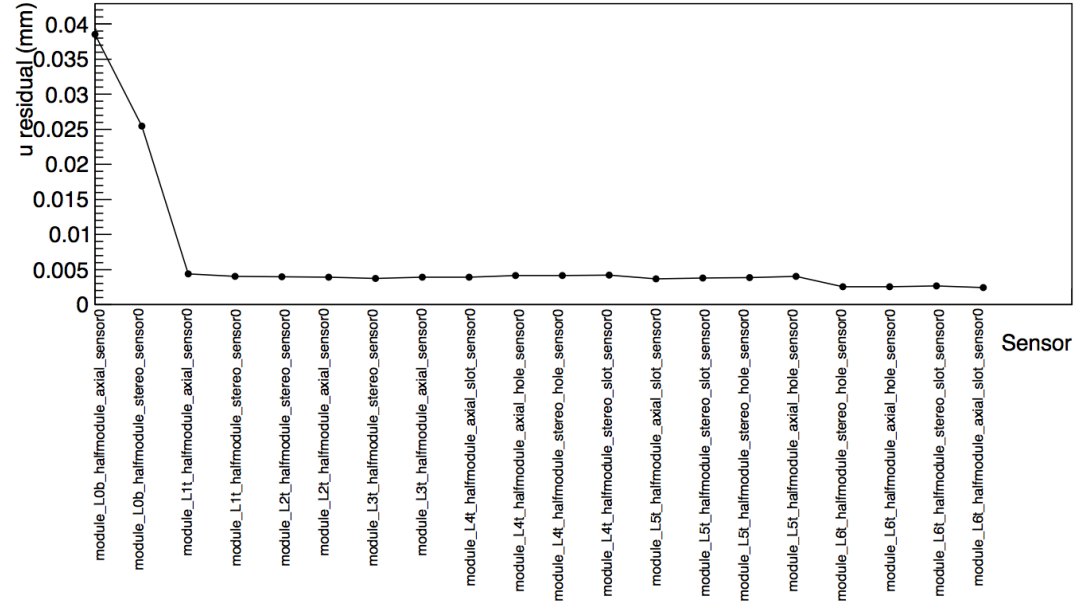
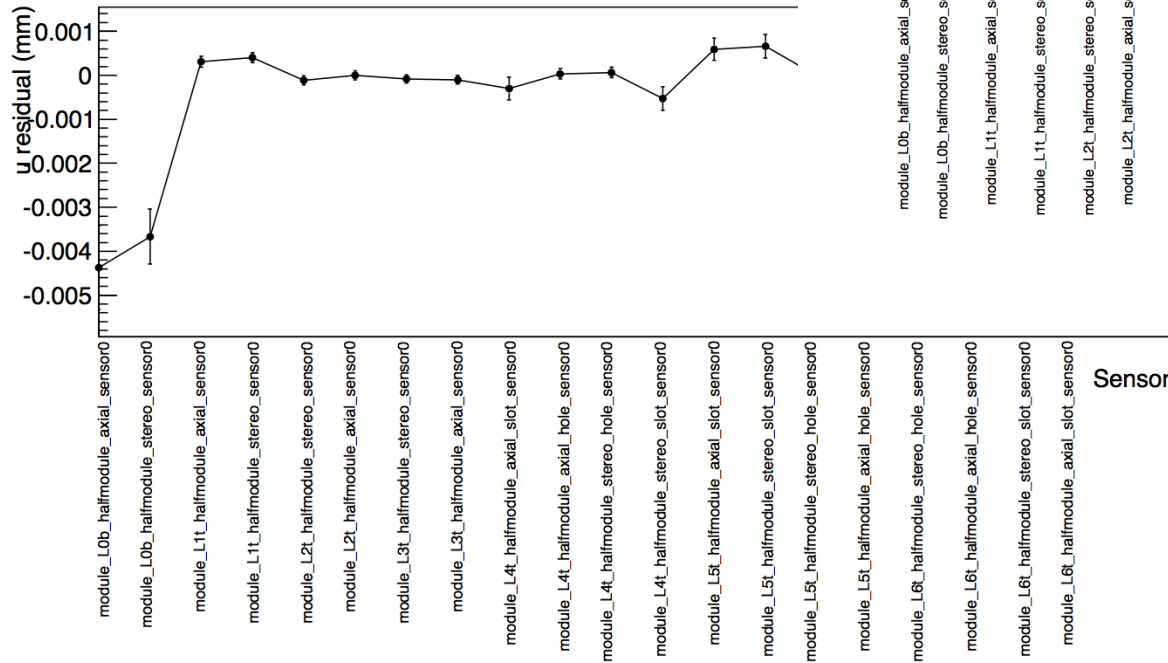
- Blowing up widths didn't help. Not sure why.
- Note that both axial/stereo beamspot is blown up. I think it means that downstream plane should get a kink only one matters (downstream one?)

```
<addBeamspot>true</addBeamspot>
  <beamspotScatAngle>0.1</beamspotScatAngle>
  <beamspotWidthZ>0.05</beamspotWidthZ>
  <beamspotWidthY>0.2</beamspotWidthY>
  <beamspotTiltZOverY>0.26</beamspotTiltZOverY>
  <beamspotPosition>0.1 0.0 0.0</beamspotPosition>
```

And lots of other hacks

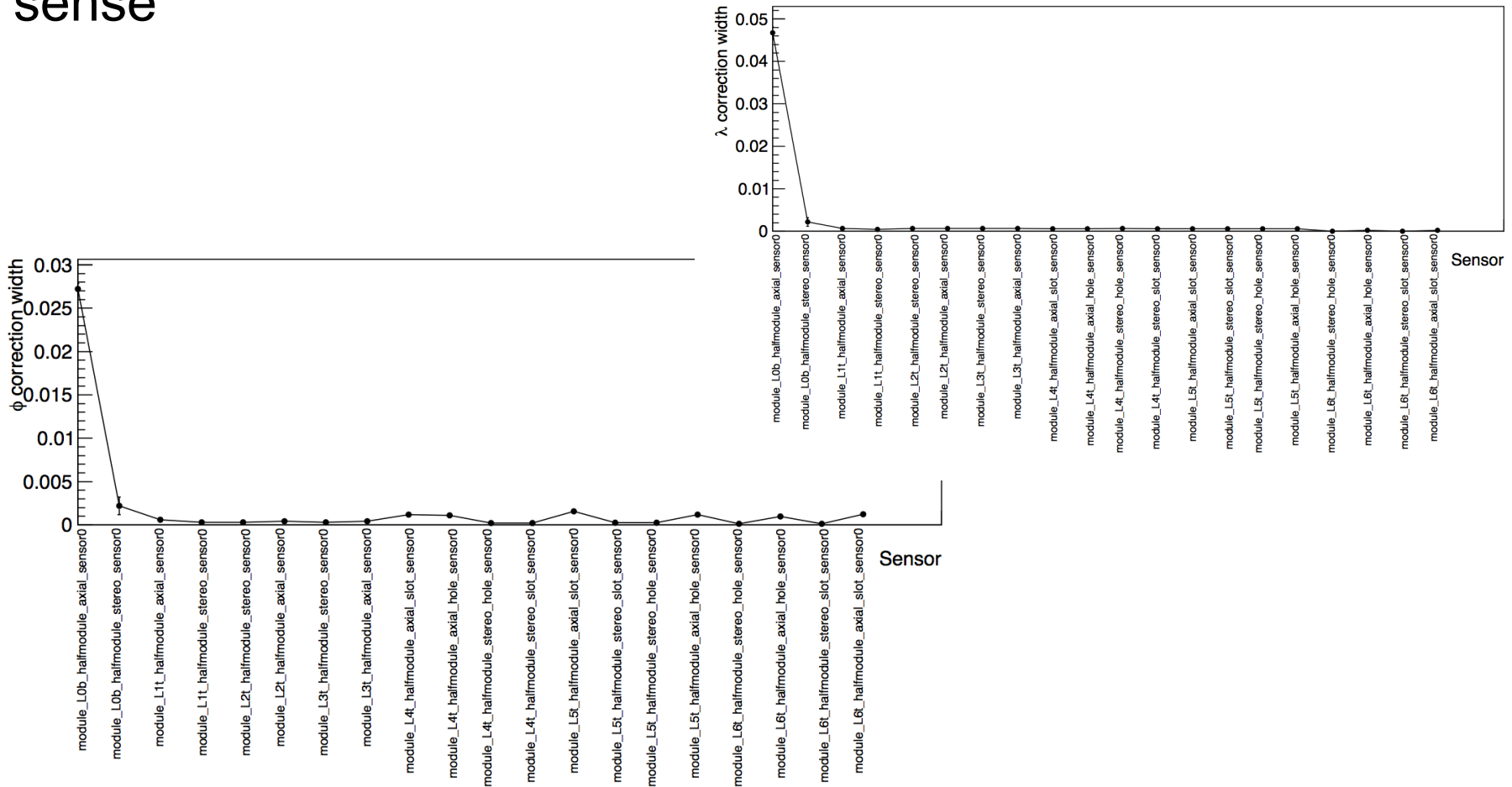
# Residuals top

Large residuals and scattering angles in GBL fit, makes sense



# Scattering angles top

Large residuals and scattering angles in GBL fit, makes sense



# Floating beamspot

Float beamspot only or in combination with L1

(Only a few k tracks here)

Idea is to feed this (with known global translations) back into the fit with smaller errors/scattering angles

See if top and bottom can get into agreement with low chi2 solution

## Beamspot only floating (u-translations only)

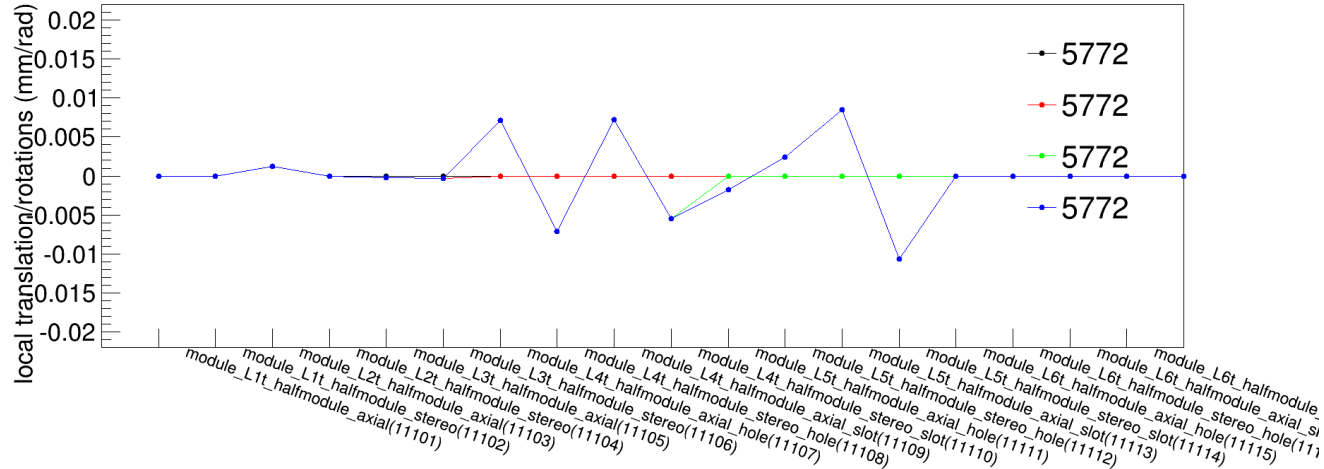
```
ip 0 b 1 :      module_L0b_halfmodule_stereo -0.024650 +- 0.004433 11198 (change -0.024650)
ip 1 b 2 :      module_L0b_halfmodule_axial -0.001998 +- 0.002917 11199 (change -0.001998)
ip 2 b 3 :      module_L0b_halfmodule_stereo 0.021996 +- 0.003731 21198 (change 0.021996)
ip 3 b 4 :      module_L0b_halfmodule_axial -0.064510 +- 0.002538 21199 (change -0.064510)
```

## Beamspot +L1 floating (u-translations only)

```
ip 0 b 1 :      module_L1t_halfmodule_axial 0.003910 +- 0.002595 11101 (change 0.003910)
ip 1 b 2 :      module_L1t_halfmodule_stereo -0.002071 +- 0.002592 11102 (change -0.002071)
ip 2 b 3 :      module_L0b_halfmodule_stereo -0.011321 +- 0.007435 11198 (change -0.011321)
ip 3 b 4 :      module_L0b_halfmodule_axial -0.011576 +- 0.005667 11199 (change -0.011576)
ip 4 b 5 :      module_L1b_halfmodule_stereo -0.001488 +- 0.002054 21101 (change -0.001488)
ip 5 b 6 :      module_L1b_halfmodule_axial 0.005592 +- 0.002036 21102 (change 0.005592)
ip 6 b 7 :      module_L0b_halfmodule_stereo 0.041236 +- 0.006237 21198 (change 0.041236)
ip 7 b 8 :      module_L0b_halfmodule_axial -0.068621 +- 0.004824 21199 (change -0.068621)
```

# Float L2->L3->L4->L5 (only few k tracks)

Millepede corrections per sensor



Millepede corrections per sensor

