

2019 Detector Survey

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Stanford/SLAC
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U.S. DEPARTMENT OF
ENERGY

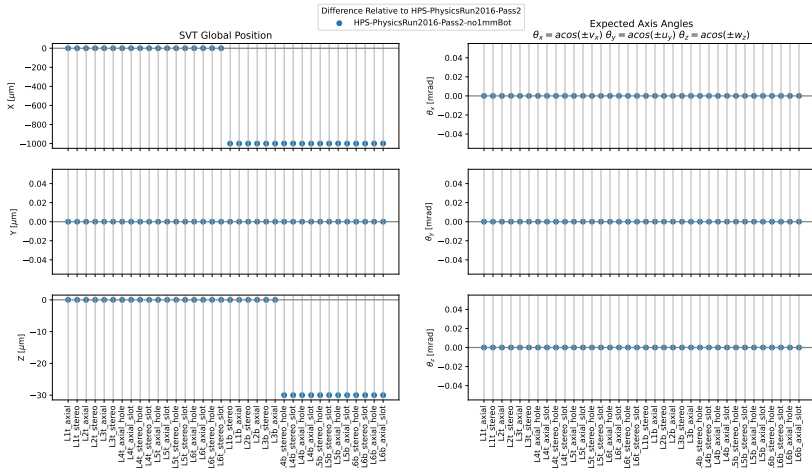
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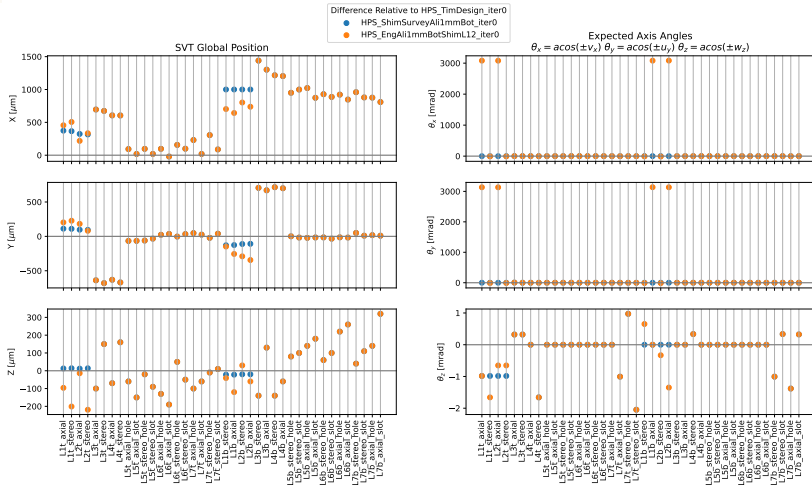
- Including Matt Solt's 2019 survey data is still work in progress
- This is a short status update; we're not done yet...
- Sarah:
 - Build tool to calculate necessary coordinate transformations
 - Parse through data and try to understand what has been measured
 - Extract survey data in correct format from Matt's measurements
- Cam:
 - Run reconstruction with new detector using 2019 FEE data (run 10104)
 - Potential bug in implementation of 30.5 mrad rotation

Bug in implementation of SVT rotation?



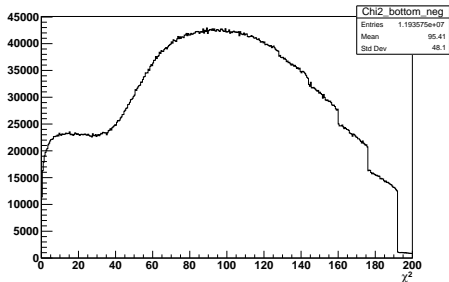
- Should not have z offset in bottom back detector

Survey detector – rel. sensor positions

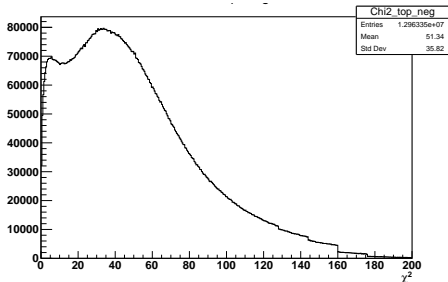


- Blue: Matt's previous survey; Orange: newly derived survey numbers

Survey detector – electron χ^2



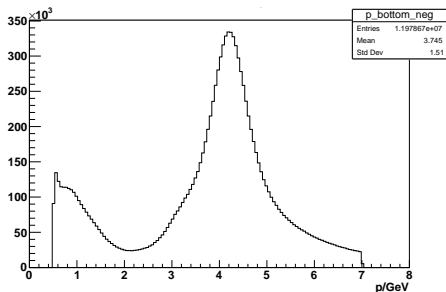
χ^2 bottom, e^- tracks



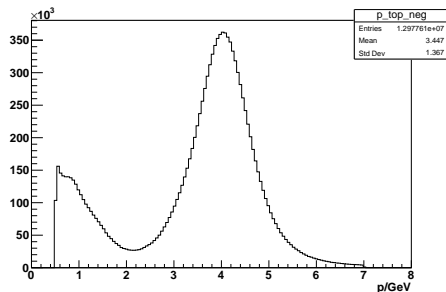
χ^2 top, e^- tracks

- χ^2 in bottom does not look good, top is better
- Both need to be improved: fix survey constants + alignment

Survey detector – electron momentum



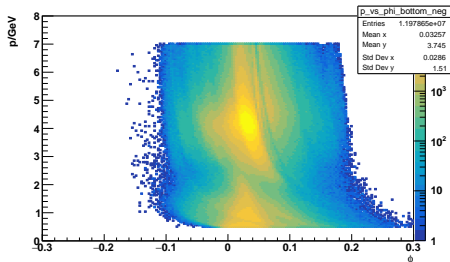
p bottom, e^- tracks



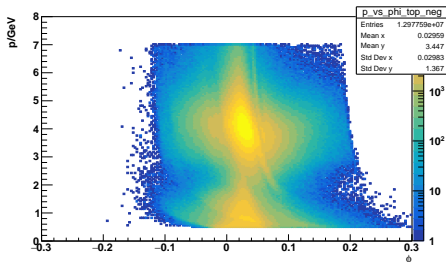
p top, e^- tracks

- Momentum peak at low momentum and around 4.1 GeV
- Top and bottom have very similar distributions

Survey detector – electron p vs ϕ



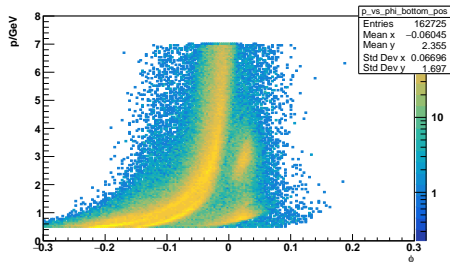
p vs ϕ bottom, e^- tracks



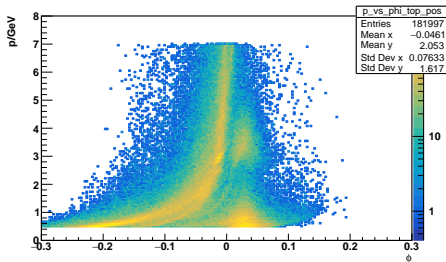
p vs ϕ top, e^- tracks

- Slot side of the back needs some alignment

Survey detector – positron p vs ϕ



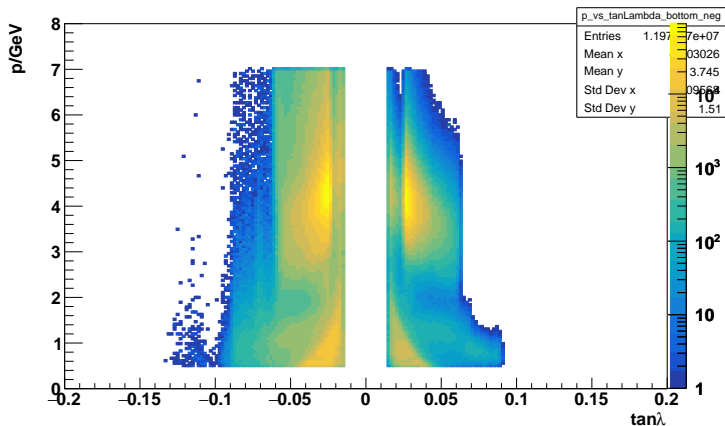
p vs ϕ bottom, e^+ tracks



p vs ϕ top, e^+ tracks

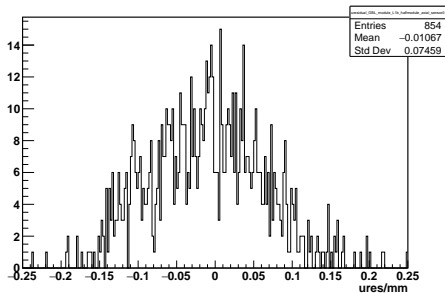
- Band from low phi and low momentum up to about 0 phi and high momentum: unclear where it is coming from

Survey detector – electron p vs $\tan \lambda$

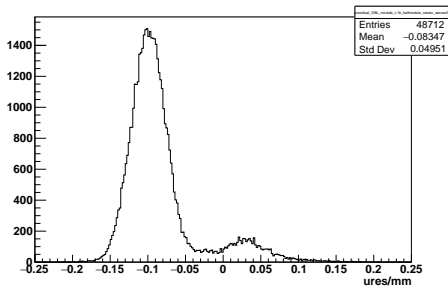


- p vs $\tan \lambda$ trend still seems to be there
- After finishing L1/L2: need to compare to previous results

Survey detector – ures L1b



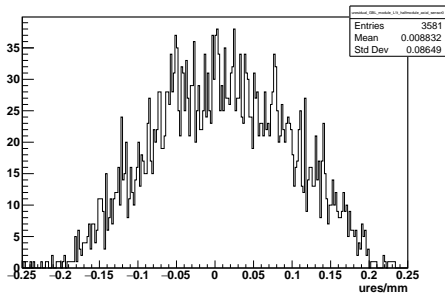
L1b axial



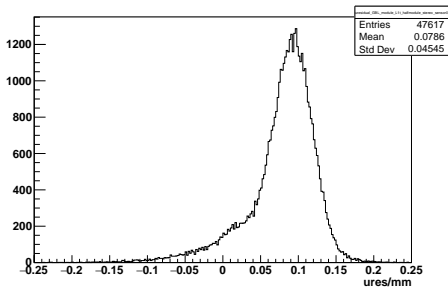
L1b stereo

- Very few hits in axial sensor
- Unbiased residual shifted away from zero in stereo sensor

Survey detector – ures L1t



L1t axial

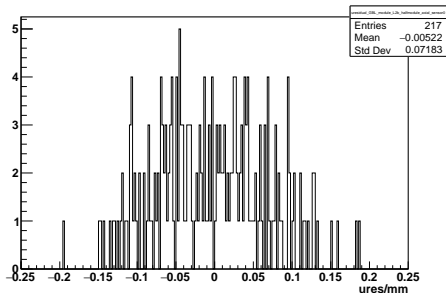


L1t stereo

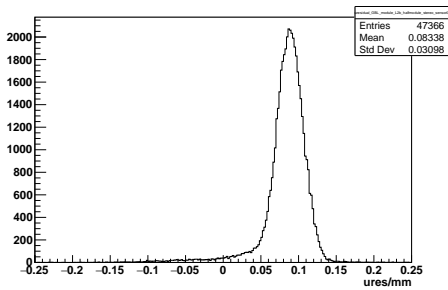
- Very few hits in axial sensor
- Unbiased residual shifted away from zero in stereo sensor

- Need to look into what exactly causes the z discrepancy when shifting bottom by 1 mm
 - This bug also effects 2016 paper detector
- Layers 1 and 2 have pretty large residuals so need to reiterate on this
 - Not clear yet if this is a bug in getting the survey constants or if this is as good as it will get with Matt's survey
- Alignment parameters from 2016 now in for layers 3-7

Survey detector – ures L2b



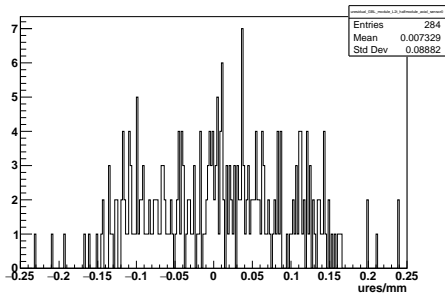
L2b axial



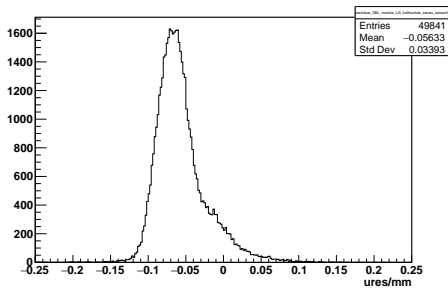
L2b stereo

- Very few hits in axial sensor
- Unbiased residual shifted away from zero in stereo sensor

Survey detector – ures L2t



L2t axial



L2t stereo

- Very few hits in axial sensor
- Unbiased residual shifted away from zero in stereo sensor