Straight Track Alignment

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Event Samples

- Skimmed off events in evio format for run 8100

- Required hits in all 12 modules

- Reconstruct these from scratch using the latest git master snapshot and a dedicated field-off Driver for pattern recognition and fitting.

- HPS-PhysicsRun2016-Nominal-v5-0-fieldmap

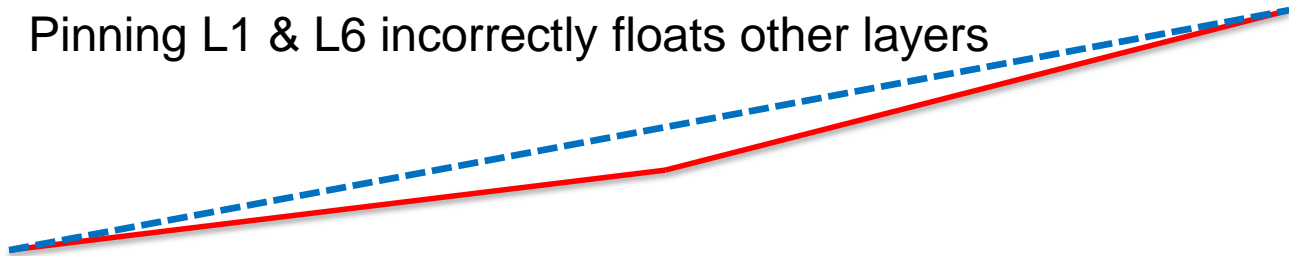- Fitting tracks separately using L1-L3 and L4-L6 shows evidence of residual SVT angle.

SVT Opening Angle

- Currently working to correct for opening angle before proceeding to global alignment.
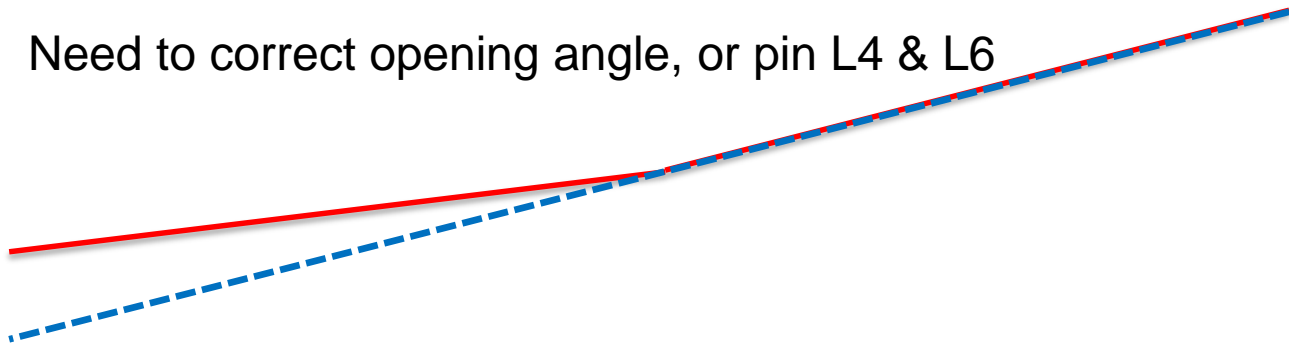
Incorrect Opening Angle
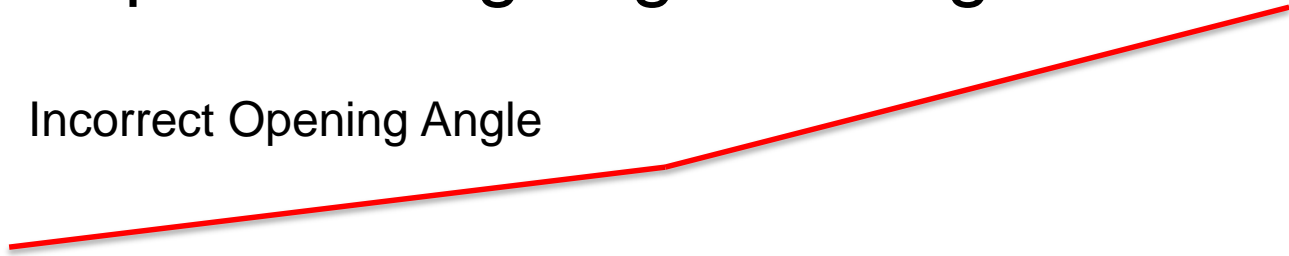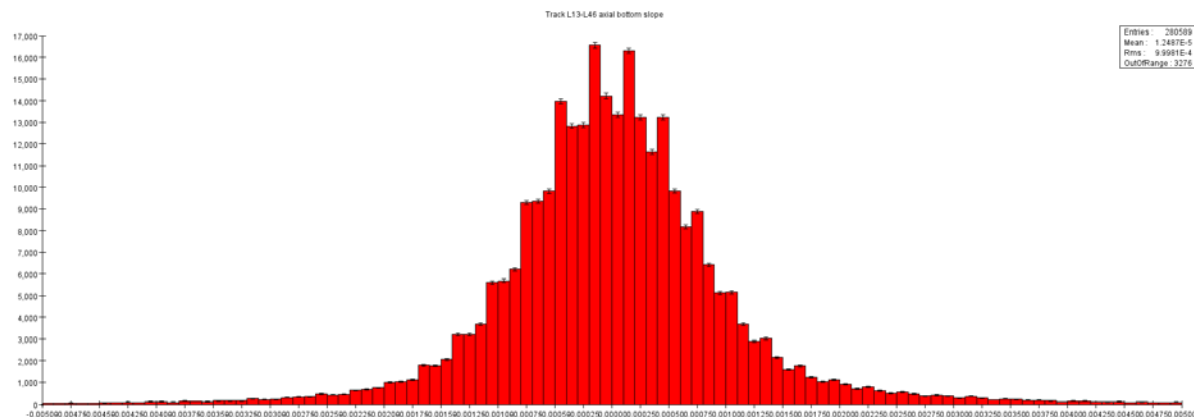
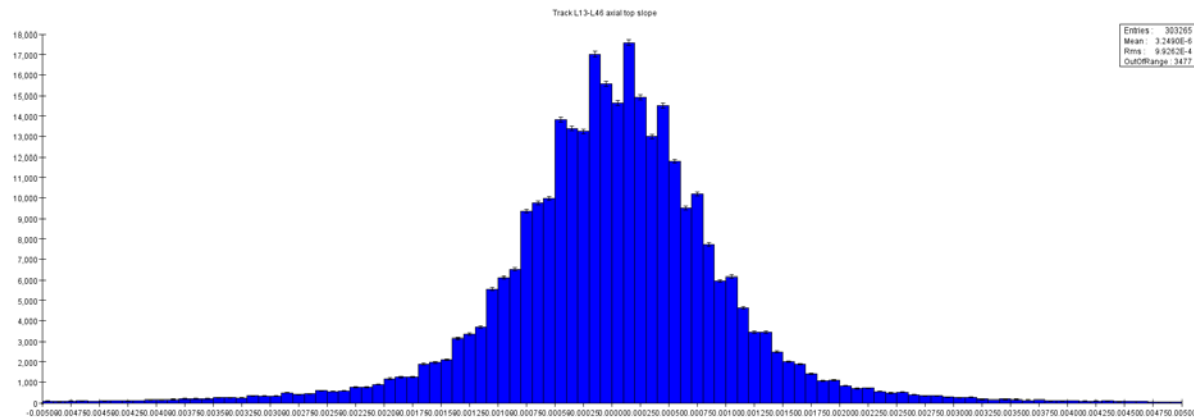Pinning L1 & L6 incorrectly floats other layers

Need to correct opening angle, or pin L4 & L6
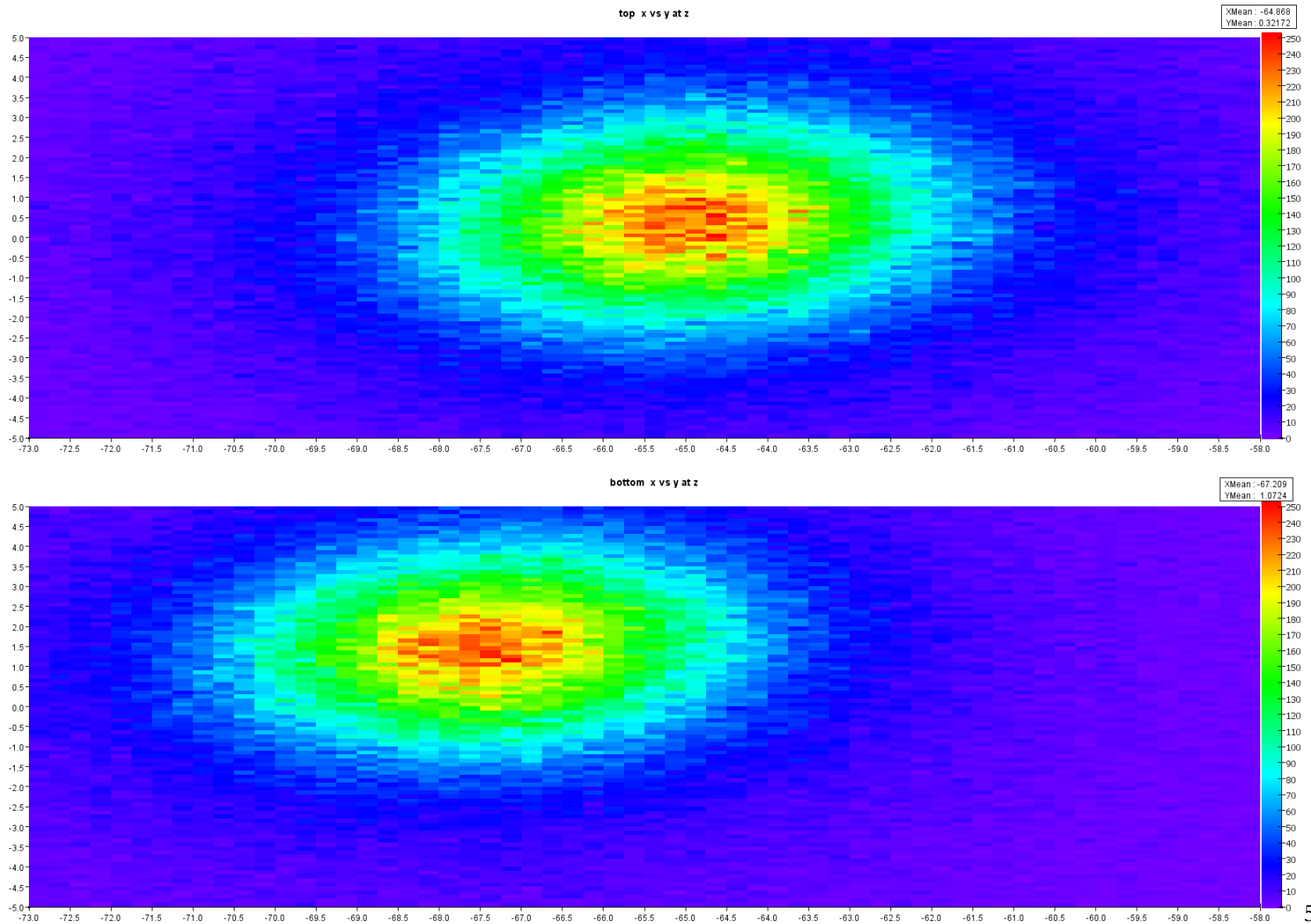
SVT Adjustment

- Adjust SVT opening angle with
  - <millepede_constant name="13100" value="0.0002"/>
  - <millepede_constant name="23100" value="-0.00026"/>

Track Extrapolation to HARP wire

top x vs y at z

XMean : -64.868
YMean : 0.32172

bottom x vs y at z

XMean : -67.209
YMean : 1.0724

Moving Forward (or up and down & around)

- The mean position for top tracks is (-64.9, 0.3)
- The mean for bottom tracks is (-67.2, 1.1)
- Were expecting the beam to be at (-68., 0.)
  - Both top and bottom X and Y are now closer to the expected beam position at the HARP wire.
- Alignment procedure
  - Fix beam spot at (-68., 0.)
  - Fix layer 4 axial and stereo layers
    - Layer 4 is closer to the center-of-gravity of the SVT measurement system, so adjustments to 1-3 & 5-6 should be somewhat better balanced.
  - Float remaining layers

Status

- Most of the tools and data are now in place. Proceeding deliberately to understand and correct the field-off straight tracks.

- Working on documentation.

- Working on run requirements to make sure we have sufficient quantity and types of calibration/alignment data early on.