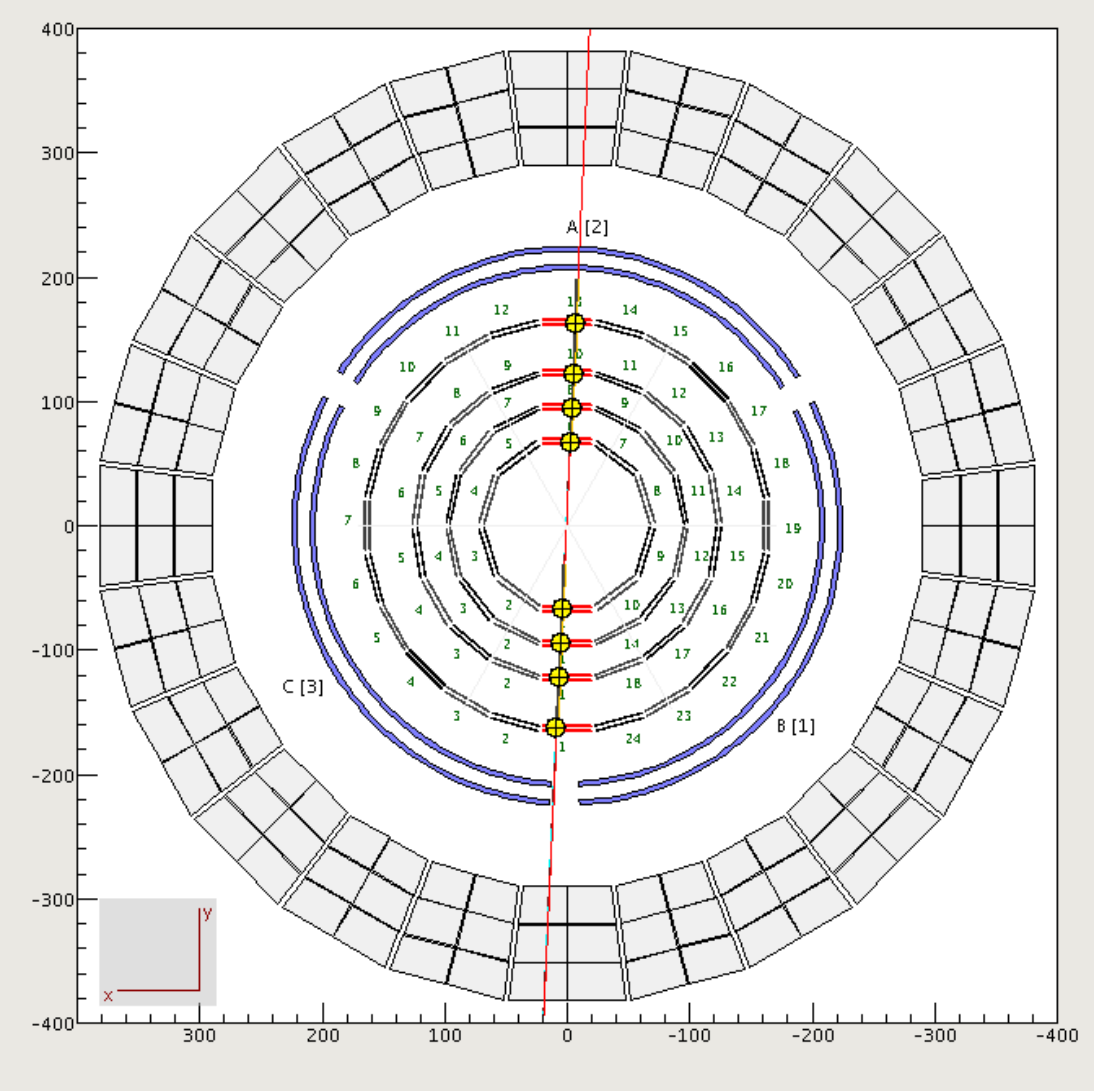
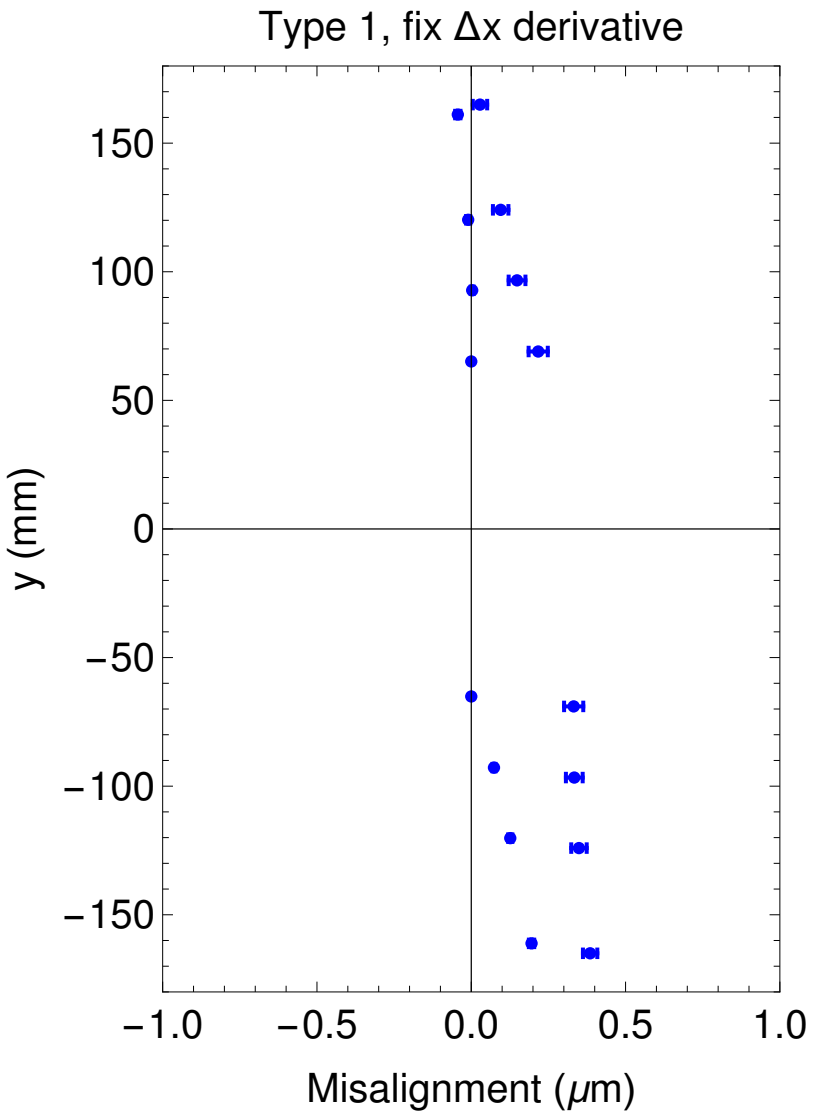
CLAS12 SVT Geometry

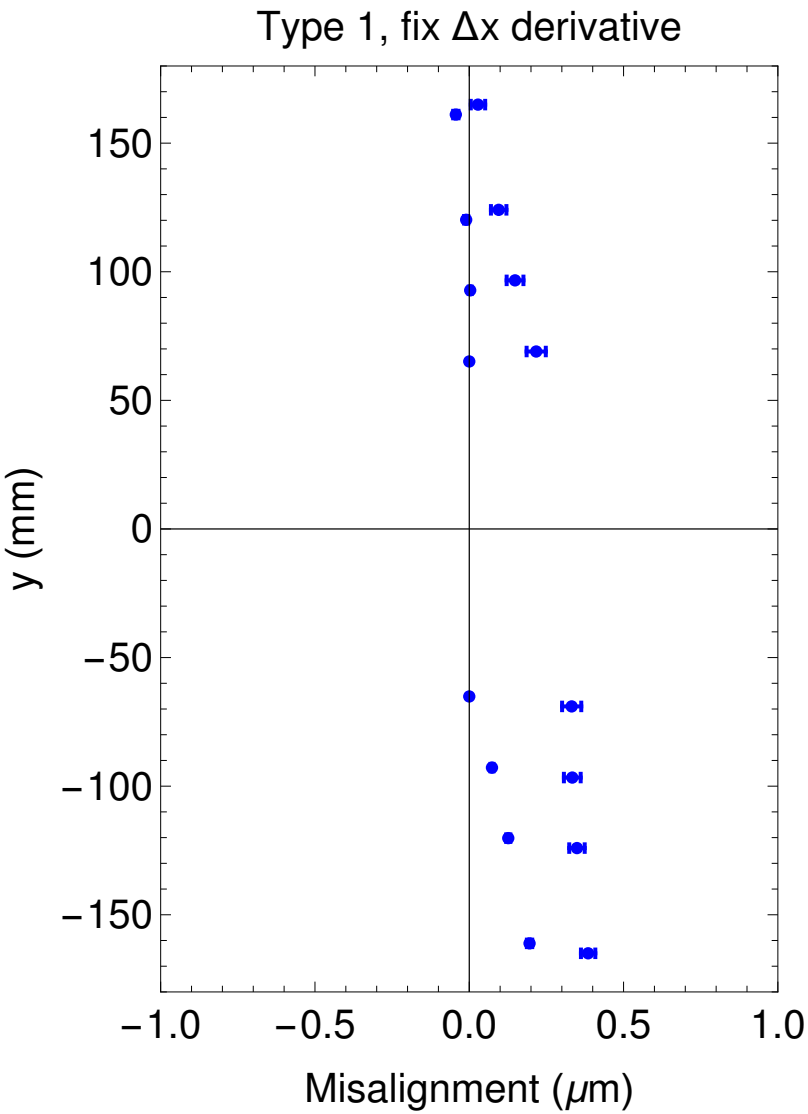


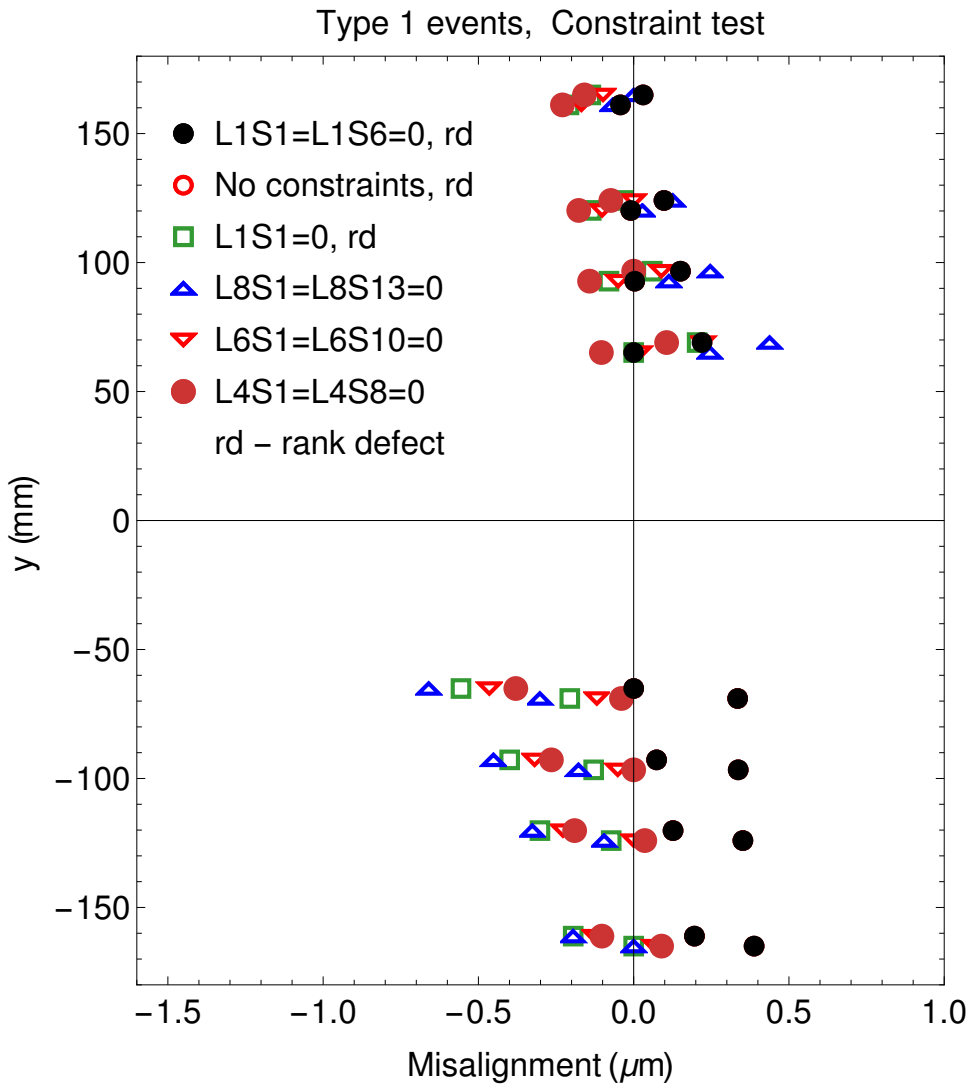
1. Goal: Correct mis-alignments of SVT to reach design resolution of $\approx 65\ \mu m$.
2. Use `millepede` which does linear least-squares for large numbers of global parameters.
3. Requires calculation of track residuals with respect to SVT strips.
4. Using Type 1 *gemc* tracks.
5. Compare results with residuals from clas12-reconstruction.

CLAS12 SVT Geometry

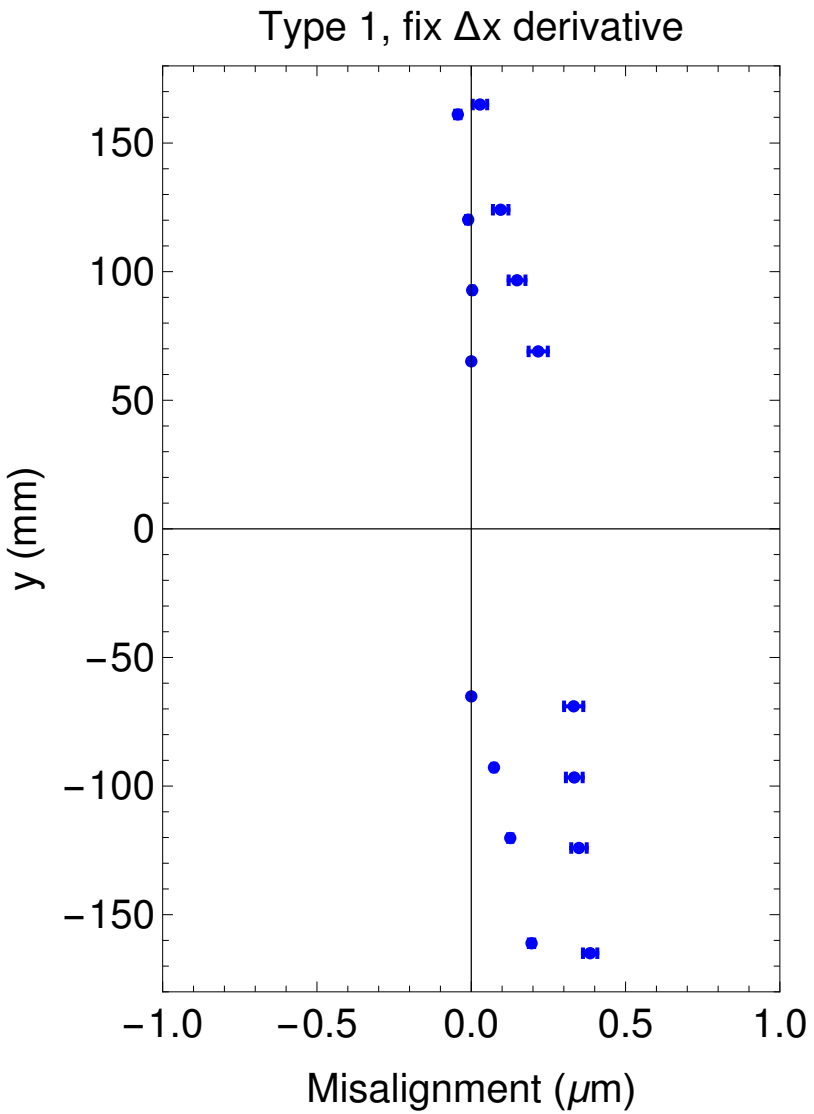


CLAS12 SVT Geometry





CLAS12 SVT Geometry



1. `Millepede` performs linear least squares and a matrix inversion.
2. Rank defect: Matrix is singular and has no inverse.
3. We are fitting a straight line (a cosmic ray with no magnetic field) in three dimensions so we need to fix two reference points. It should not matter where they are.
4. It did here. With L1S1 and L1S6 fixed millepede returned a rank defect. For other layers fixed it did not.
5. From Claus Kleinwort (DESY): "The answer is simple: Bad luck with numerical precision - a nice show case for me."
6. There are two ways in `millepede` to impose constraints. I picked the less numerically robust one.
7. Switching methods removed the rank defect for the L1S1-L1S6 constraint without effecting the other fits.