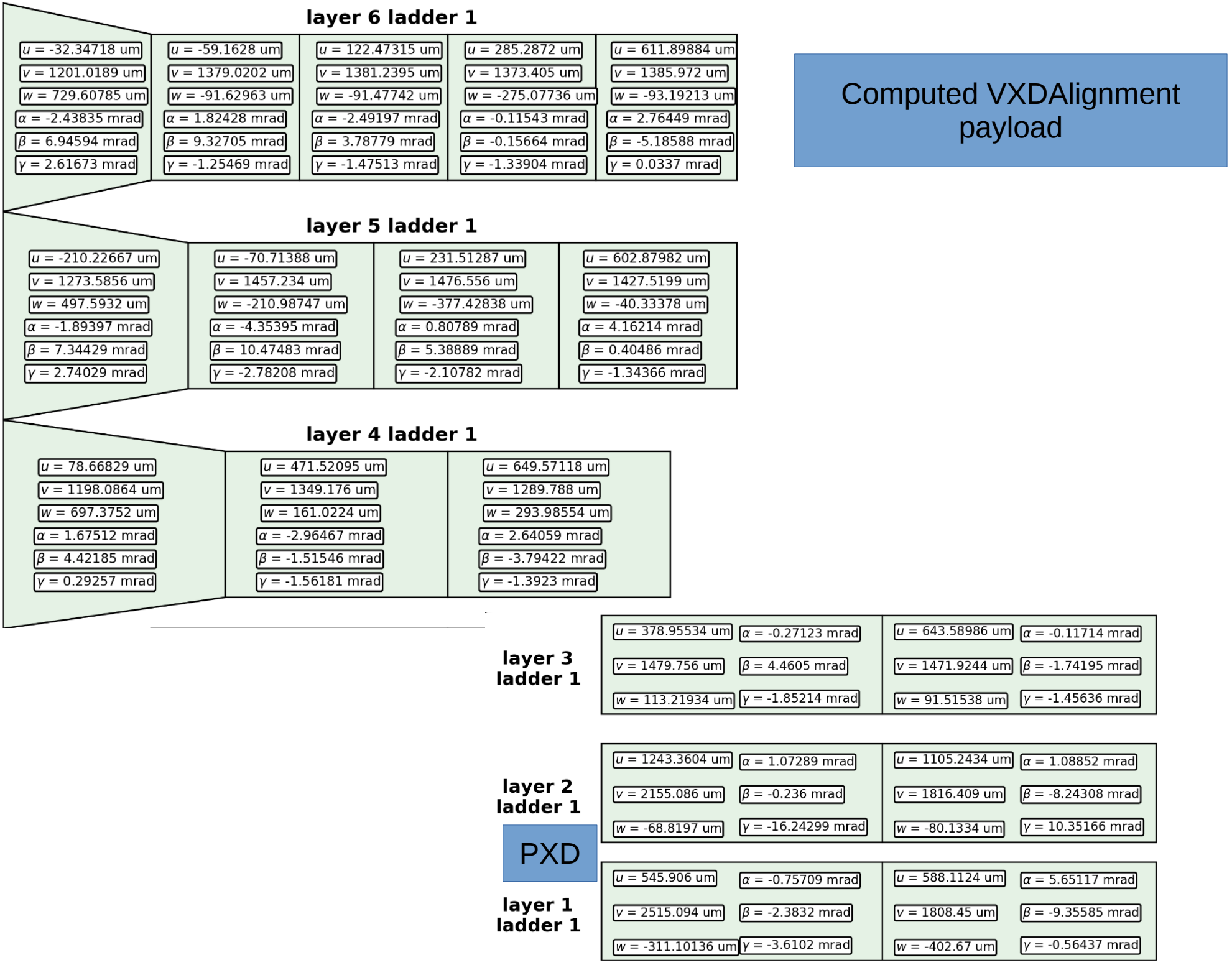
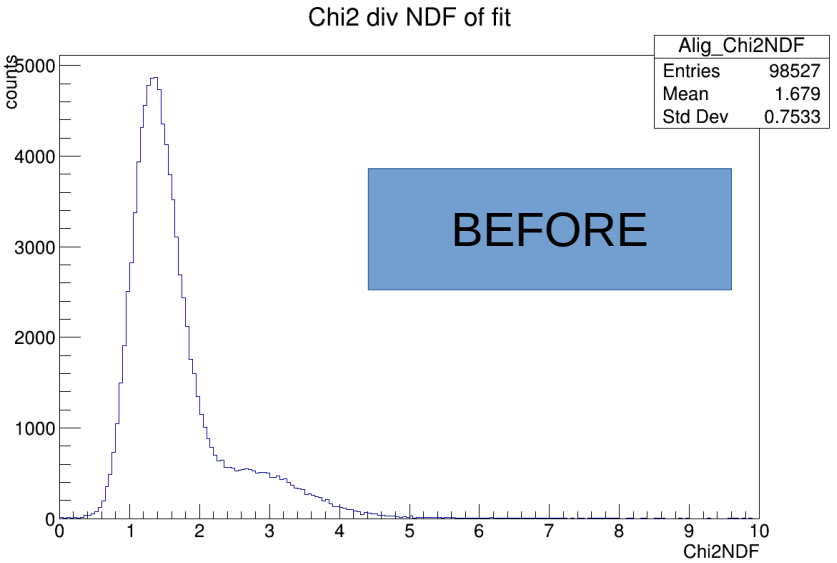
VXDAlignment

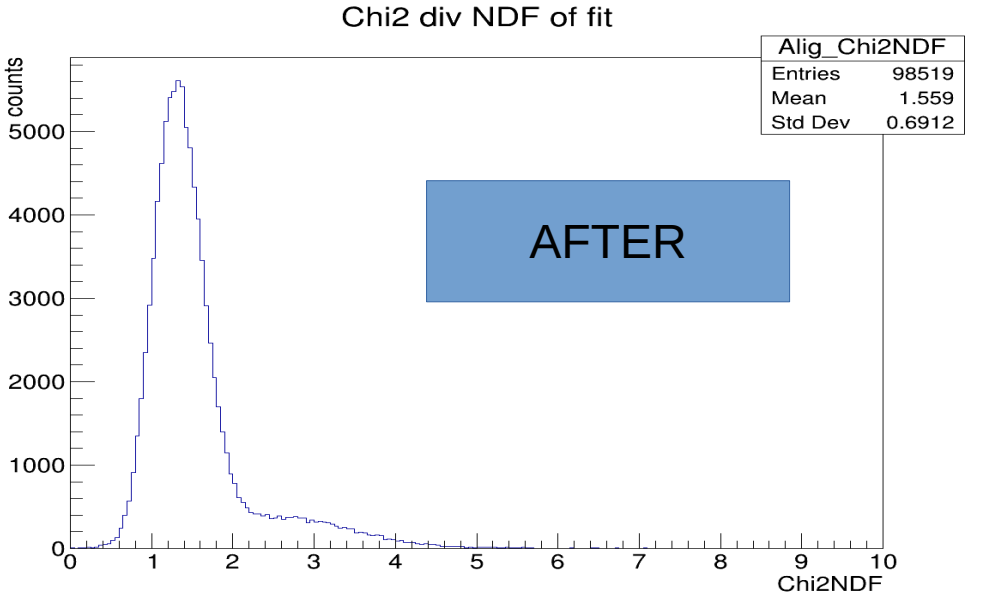
Tracking Meeting, April 20th 2018

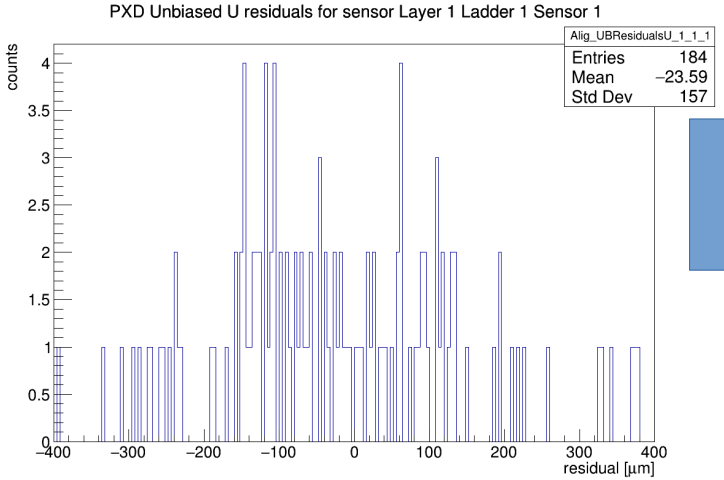
- Master
- 332_COPY-OF_GT_gen_prod_004.11_Master-20171213-230000
- Runs 904,905,906,919,920,938,1107,1110
  - Total ~36k merged tracks
  - Mostly single VXD hit, just about 100 tracks per PXD sensor
- MinClusterTime=-999
- AlignDQM module for residual distros

- Stadard cosmic reco (merging/no merging): all VXD histos empty (!?)
- Only Jakub's merging works
- You can test alignment from local DB:
  - /home/belle2/bilka/GCR2VXDAlignment_init/database.txt
- Track finders (still) do not take alignment corrections into account (!)
  - I run over pre-selected events (where VXD hits were on track) – no change in track finding efficiency

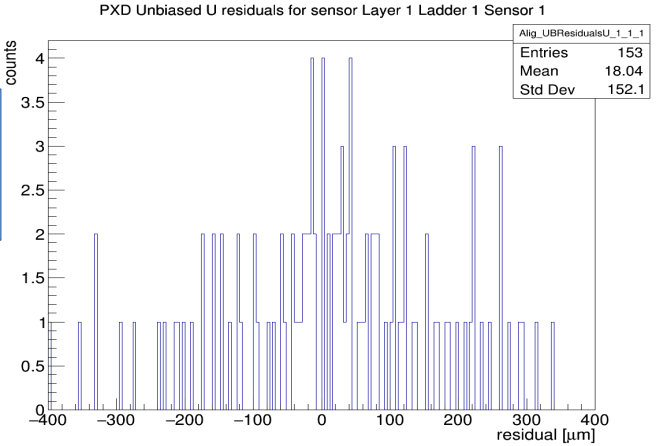

layer 6 ladder 1
u = -32.34718 um
v = 1201.0189 um
w = 729.60785 um
α = -2.43835 mrad
β = 6.94594 mrad
γ = 2.61673 mrad
u = -59.1628 um
v = 1379.0202 um
w = -91.62963 um
α = 1.82428 mrad
β = 9.32705 mrad
γ = -1.25469 mrad
u = 122.47315 um
v = 1381.2395 um
w = -91.47742 um
α = -2.49197 mrad
β = 3.78779 mrad
γ = -1.47513 mrad
u = 285.2872 um
v = 1373.405 um
w = -275.07736 um
α = -0.11543 mrad
β = -0.15664 mrad
γ = -1.33904 mrad
u = 611.89884 um
v = 1385.972 um
w = -93.19213 um
α = 2.76449 mrad
β = -5.18588 mrad
γ = 0.0337 mrad
Computed VXDAlignment payload
layer 5 ladder 1
u = -210.22667 um
v = 1273.5856 um
w = 497.5932 um
α = -1.89397 mrad
β = 7.34429 mrad
γ = 2.74029 mrad
u = -70.71388 um
v = 1457.234 um
w = -210.98747 um
α = -4.35395 mrad
β = 10.47483 mrad
γ = -2.78208 mrad
u = 231.51287 um
v = 1476.556 um
w = -377.42838 um
α = 0.80789 mrad
β = 5.38889 mrad
γ = -2.10782 mrad
u = 602.87982 um
v = 1427.5199 um
w = -40.33378 um
α = 4.16214 mrad
β = 0.40486 mrad
γ = -1.34366 mrad
layer 4 ladder 1
u = 78.66829 um
v = 1198.0864 um
w = 697.3752 um
α = 1.67512 mrad
β = 4.42185 mrad
γ = 0.29257 mrad
u = 471.52095 um
v = 1349.176 um
w = 161.0224 um
α = -2.96467 mrad
β = -1.51546 mrad
γ = -1.56181 mrad
u = 649.57118 um
v = 1289.788 um
w = 293.98554 um
α = 2.64059 mrad
β = -3.79422 mrad
γ = -1.3923 mrad
layer 3 ladder 1
u = 378.95534 um
α = -0.27123 mrad
v = 1479.756 um
β = 4.4605 mrad
w = 113.21934 um
γ = -1.85214 mrad
u = 643.58986 um
α = -0.11714 mrad
v = 1471.9244 um
β = -1.74195 mrad
w = 91.51538 um
γ = -1.45636 mrad
layer 2 ladder 1
u = 1243.3604 um
α = 1.07289 mrad
v = 2155.086 um
β = -0.236 mrad
w = -68.8197 um
γ = -16.24299 mrad
u = 1105.2434 um
α = 1.08852 mrad
v = 1816.409 um
β = -8.24308 mrad
w = -80.1334 um
γ = 10.35166 mrad
PXD
layer 1 ladder 1
u = 545.906 um
α = -0.75709 mrad
v = 2515.094 um
β = -2.3832 mrad
w = -311.10136 um
γ = -3.6102 mrad
u = 588.1124 um
α = 5.65117 mrad
v = 1808.45 um
β = -9.35585 mrad
w = -402.67 um
γ = -0.56437 mrad

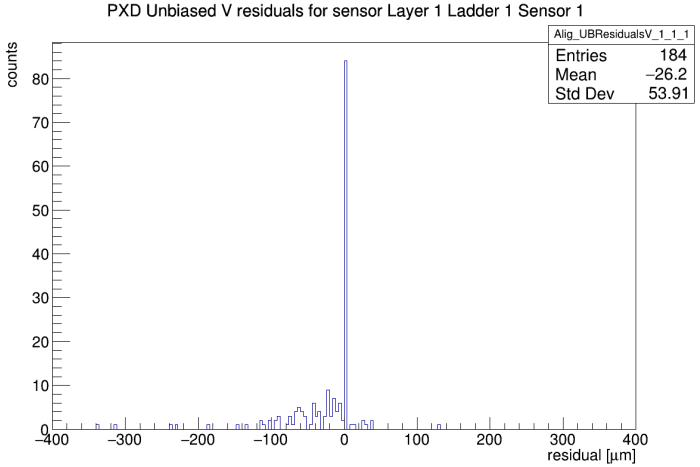


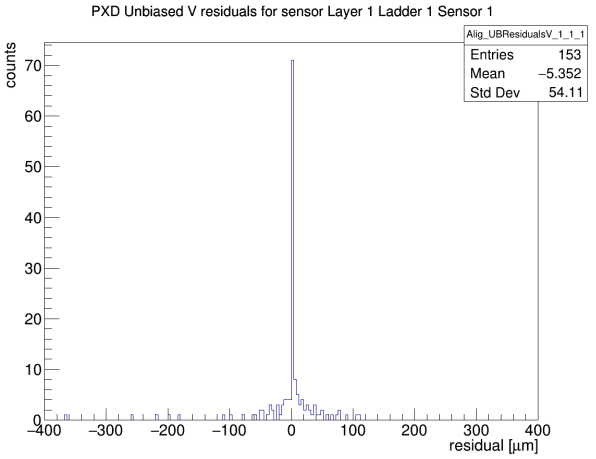




Examples of residuals PXD



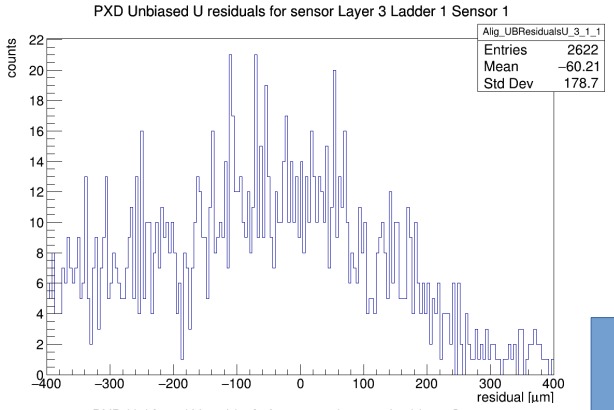


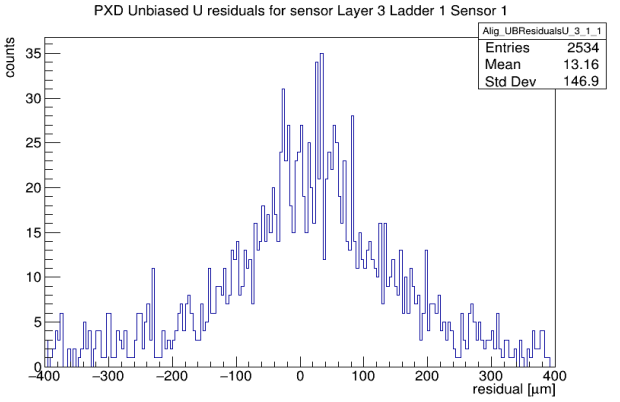


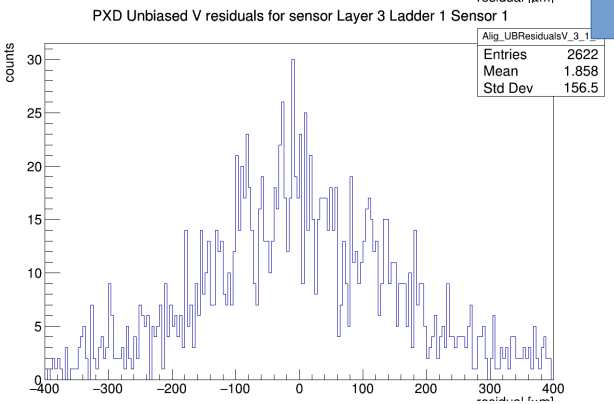
Examples of residuals SVD

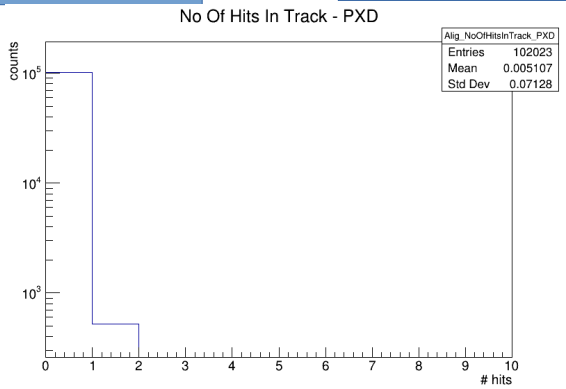
BEFORE

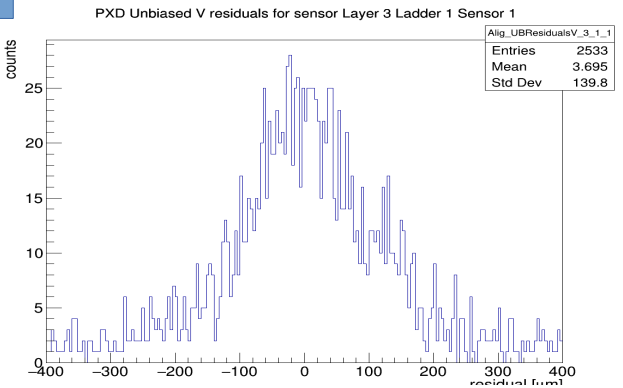
AFTER

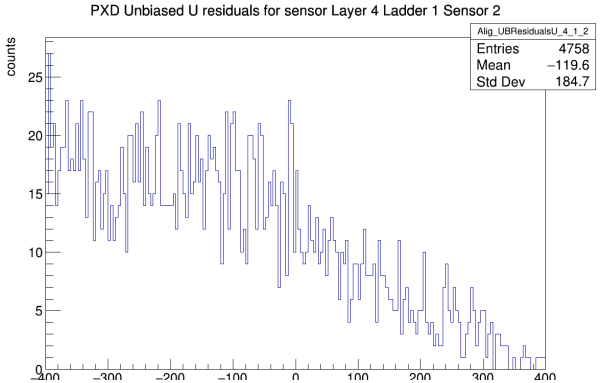


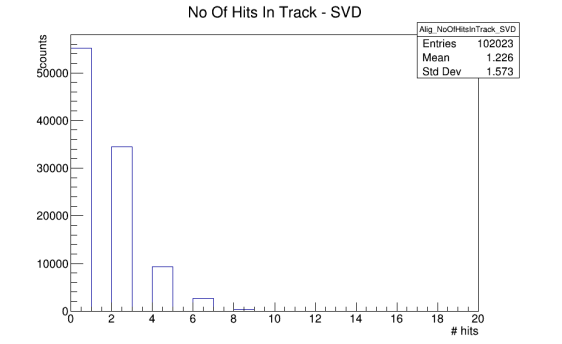


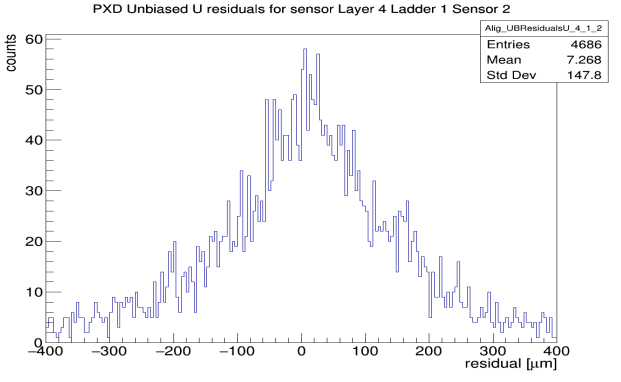


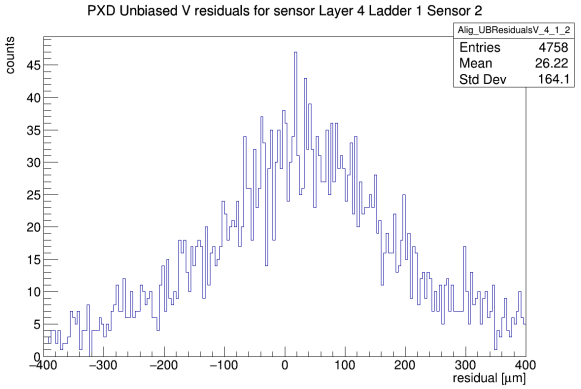


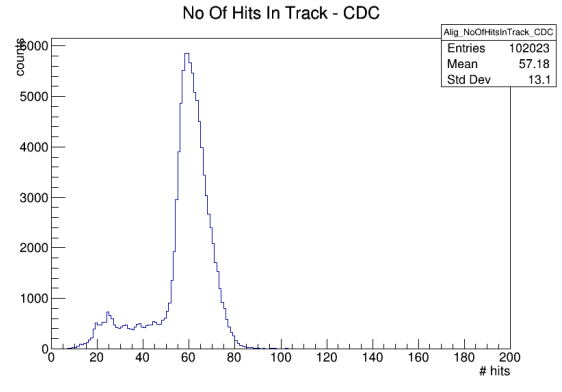


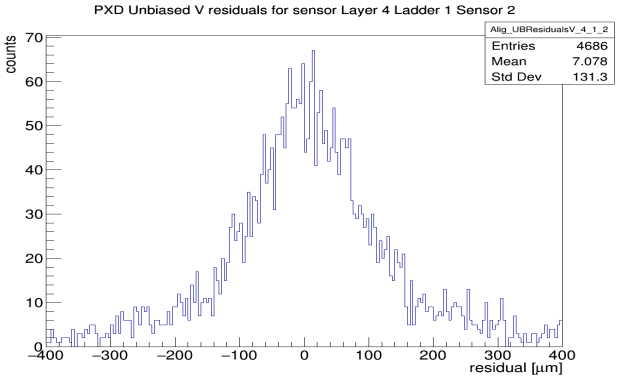












- Limited precision (50um in PXD, SVD better)
- Large > 1 mm misalignment to CDC
  - w.r.t. to CDC – only reference we have now
  - Should go into displacement
  - First collision data – new reference: IP position
- Also large relative misalignment of PXD vs. SVD
  - Could be a problem for VXDTF2, ROIs
  - Alignment corrections mostly ignored (!)