Alignments

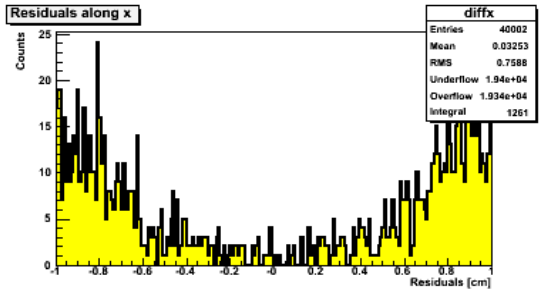
- Available (Xmas good runs):
  COSM05677-5788(2102153 ev)
- TO BE ADDED :
  last week ones from COSM05977 to now

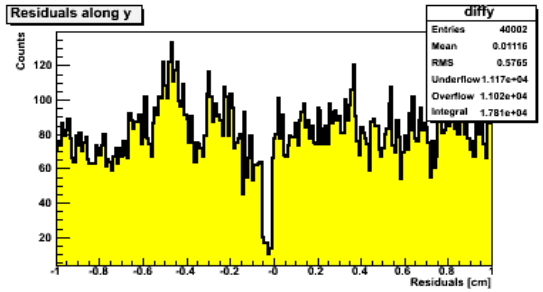
- USED 111 runs: n-tuple entries(Good fit(the fit is done on straws only),good straw residues)→70059→6803 with 4 chambers
- TO BE DONE : exclusion of FITS using straws with TDC bad flag (the effect is being studied by L. Benussi)

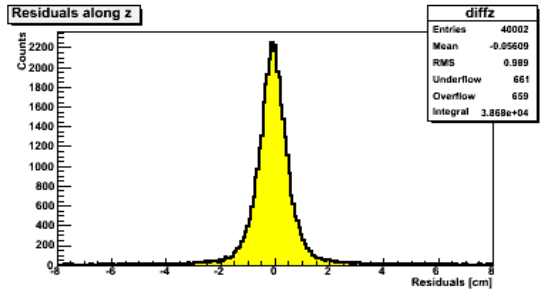
IT IS CRUCIAL TO USE THE CLEANEST DATA SET

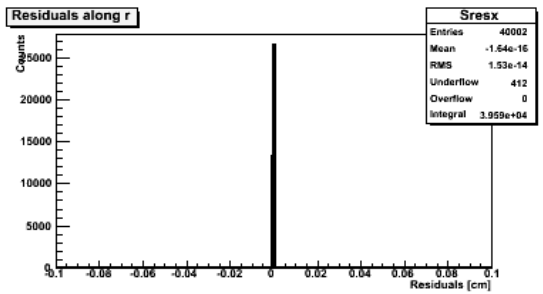
FIRST LOOK TO THE RESIDUES

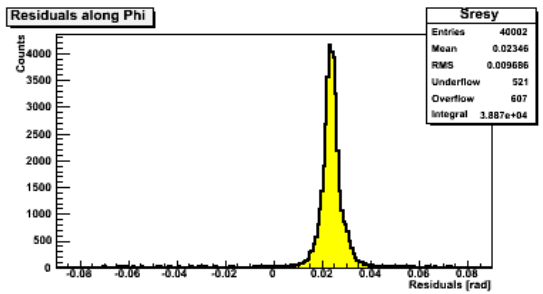
- Looking to the straws fitting with the other detector layers
- The straw are taken as fixed(as they are from the very beginning)→ we should move the other detector layers
- The mechanical support of vertex is different form the one of straws and dch(Clepsydra)

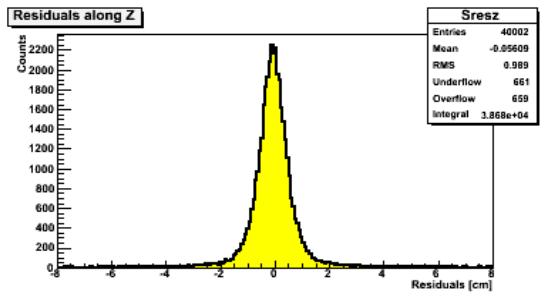

Residuals along x
diffx
Entries 40002
Mean 0.03253
RMS 0.7588
Underflow 1.94e+04
Overflow 1.934e+04
Integral 1251
Counts
Residuals [cm]

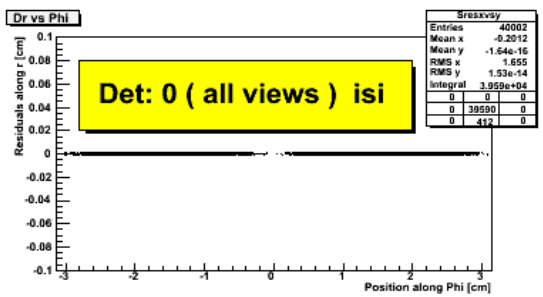

Residuals along y
diffy
Entries 40002
Mean 0.01116
RMS 0.5765
Underflow 1.117e+04
Overflow 1.102e+04
Integral 1.781e+04
Counts
Residuals [cm]

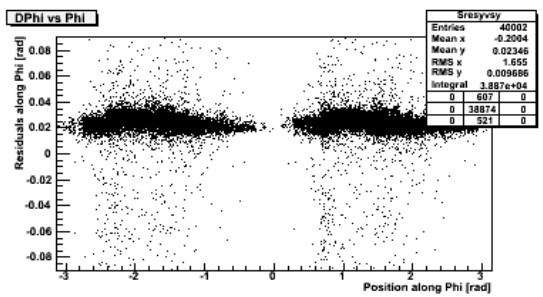

Residuals along z
diffz
Entries 40002
Mean -0.05609
RMS 0.989
Underflow 661
Overflow 659
Integral 3.868e+04
Counts
Residuals [cm]

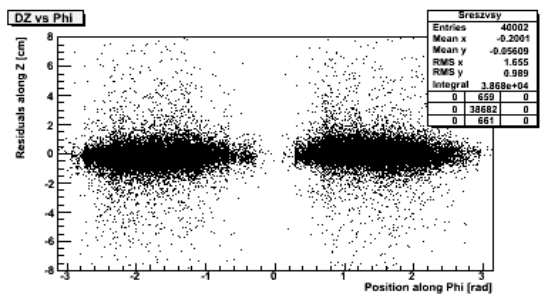

Residuals along r
Sresx
Entries 40002
Mean -1.64e-16
RMS 1.53e-14
Underflow 412
Overflow 0
Integral 3.959e+04
Counts
Residuals [cm]

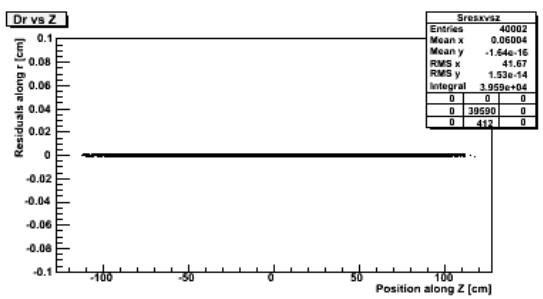

Residuals along Phi
Sresy
Entries 40002
Mean 0.02346
RMS 0.009686
Underflow 521
Overflow 607
Integral 3.887e+04
Counts
Residuals [rad]

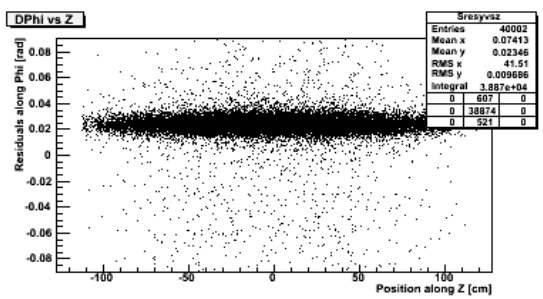

Residuals along Z
Sresz
Entries 40002
Mean -0.05609
RMS 0.989
Underflow 661
Overflow 659
Integral 3.868e+04
Counts
Residuals [cm]

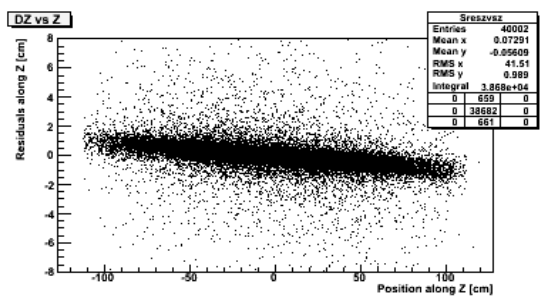

Dr vs Phi
Sresxvsy
Entries 40002
Mean x -0.2012
Mean y -1.64e-16
RMS x 1.655
RMS y 1.53e-14
Integral 3.959e+04
Det: 0 (all views) isi
Residuals along r [cm]
Position along Phi [cm]

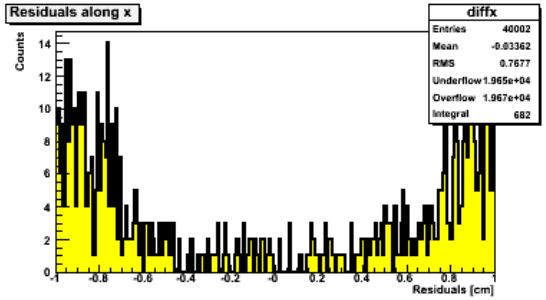

DPhi vs Phi
Sresyvsy
Entries 40002
Mean x -0.2004
Mean y 0.02346
RMS x 1.655
RMS y 0.009686
Integral 3.887e+04
Residuals along Phi [rad]
Position along Phi [rad]

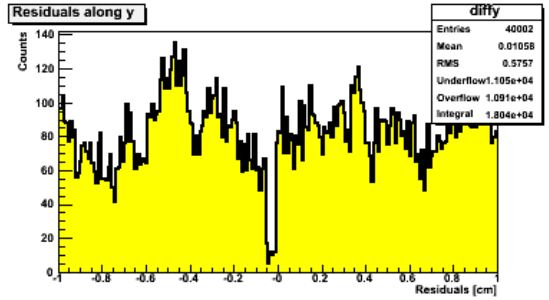

DZ vs Phi
Sreszvsy
Entries 40002
Mean x -0.2001
Mean y -0.05609
RMS x 1.655
RMS y 0.989
Integral 3.868e+04
Residuals along Z [cm]
Position along Phi [rad]

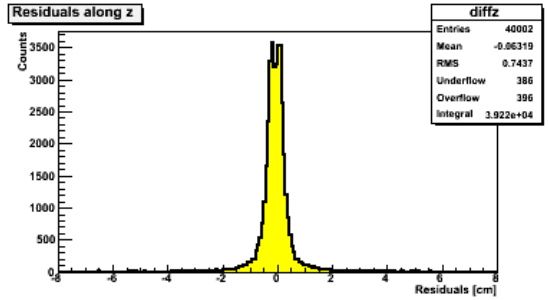

Dr vs Z
Sresxvsz
Entries 40002
Mean x 0.06004
Mean y -1.64e-16
RMS x 41.67
RMS y 1.53e-14
Integral 3.959e+04
Residuals along r [cm]
Position along Z [cm]

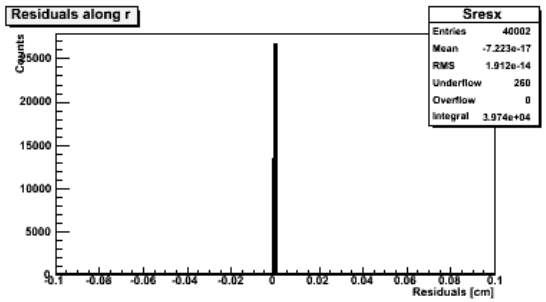

DPhi vs Z
Sresyvsz
Entries 40002
Mean x 0.07413
Mean y 0.02346
RMS x 41.51
RMS y 0.009686
Integral 3.887e+04
Residuals along Phi [rad]
Position along Z [cm]

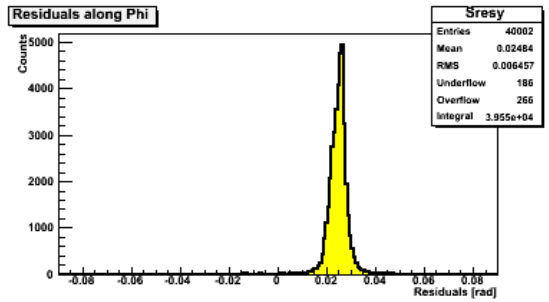

DZ vs Z
Sreszvsz
Entries 40002
Mean x 0.07291
Mean y -0.05609
RMS x 41.51
RMS y 0.989
Integral 3.868e+04
Residuals along Z [cm]
Position along Z [cm]

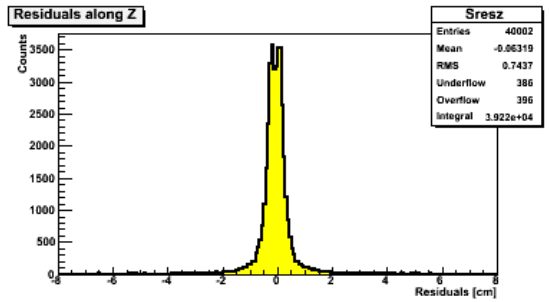

Residuals along x
diffx
Entries 40002
Mean -0.03362
RMS 0.7677
Underflow 1.965e+04
Overflow 1.967e+04
Integral 682
Counts
Residuals [cm]

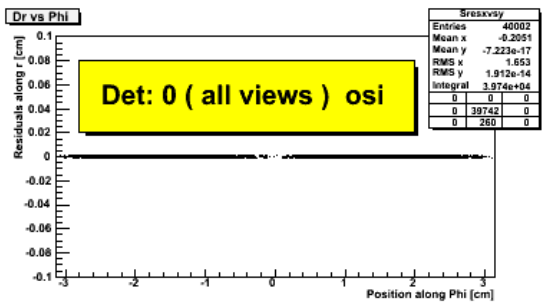

Residuals along y
diffy
Entries 40002
Mean 0.01058
RMS 0.5757
Underflow 1.105e+04
Overflow 1.091e+04
Integral 1.804e+04
Counts
Residuals [cm]

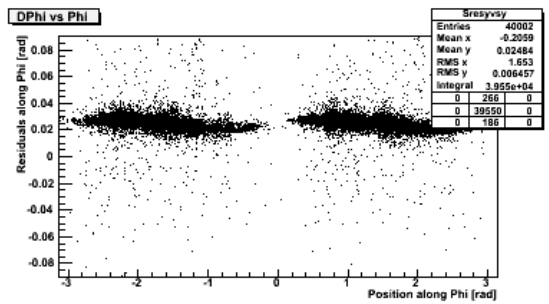

Residuals along z
diffz
Entries 40002
Mean -0.06319
RMS 0.7437
Underflow 386
Overflow 396
Integral 3.922e+04
Counts
Residuals [cm]

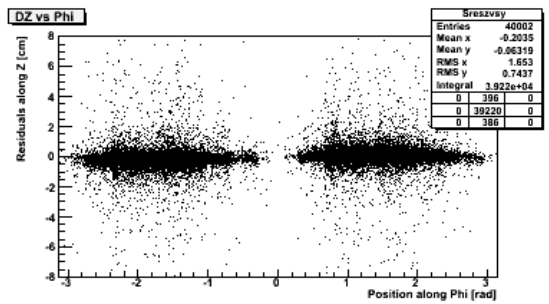

Residuals along r
Sresx
Entries 40002
Mean -7.223e-17
RMS 1.912e-14
Underflow 260
Overflow 0
Integral 3.974e+04
Counts
Residuals [cm]

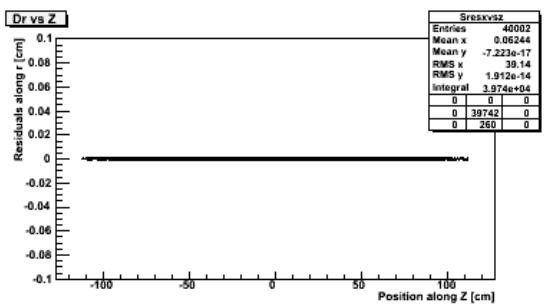

Residuals along Phi
Sresy
Entries 40002
Mean 0.02484
RMS 0.006457
Underflow 186
Overflow 266
Integral 3.955e+04
Counts
Residuals [rad]

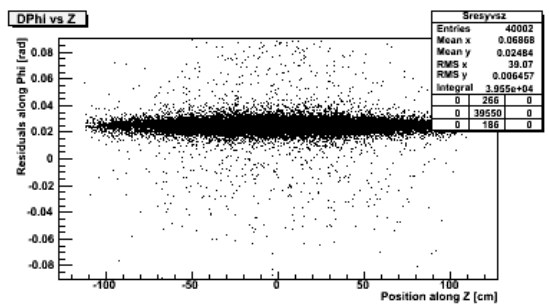

Residuals along Z
Sresz
Entries 40002
Mean -0.06319
RMS 0.7437
Underflow 386
Overflow 396
Integral 3.922e+04
Counts
Residuals [cm]

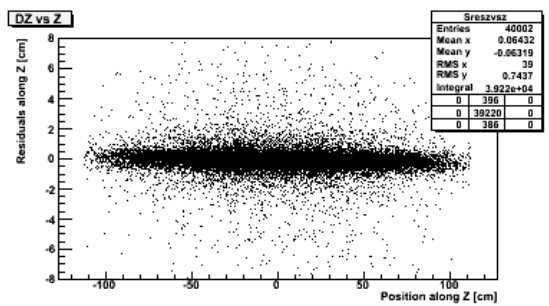

Dr vs Phi
Sresxvsy
Entries 40002
Mean x -0.2051
Mean y -7.223e-17
RMS x 1.653
RMS y 1.912e-14
Integral 3.974e+04
Det: 0 (all views) osi
Residuals along r [cm]
Position along Phi [cm]

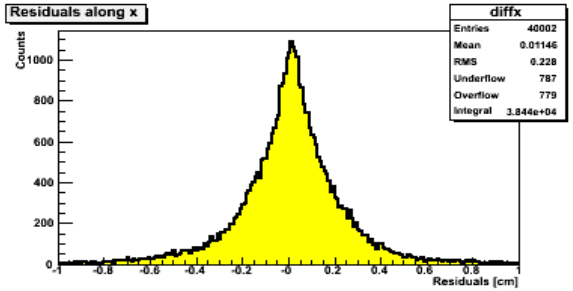

DPhi vs Phi
Sresyvsy
Entries 40002
Mean x -0.2059
Mean y 0.02484
RMS x 1.653
RMS y 0.006457
Integral 3.955e+04
Residuals along Phi [rad]
Position along Phi [rad]

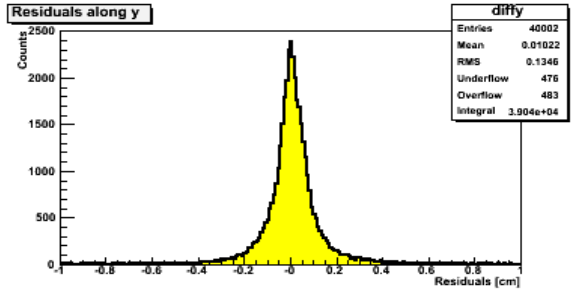

DZ vs Phi
Sreszvsy
Entries 40002
Mean x -0.2035
Mean y -0.06319
RMS x 1.653
RMS y 0.7437
Integral 3.922e+04
Residuals along Z [cm]
Position along Phi [rad]

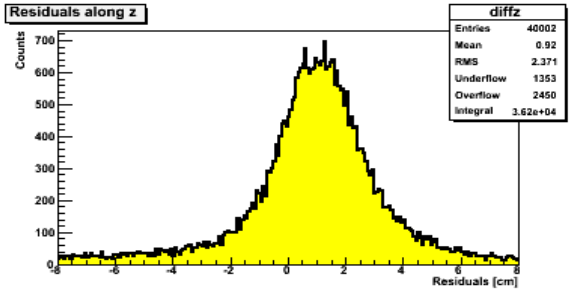

Dr vs Z
Sresxvsz
Entries 40002
Mean x 0.06244
Mean y -7.223e-17
RMS x 39.14
RMS y 1.912e-14
Integral 3.974e+04
Residuals along r [cm]
Position along Z [cm]

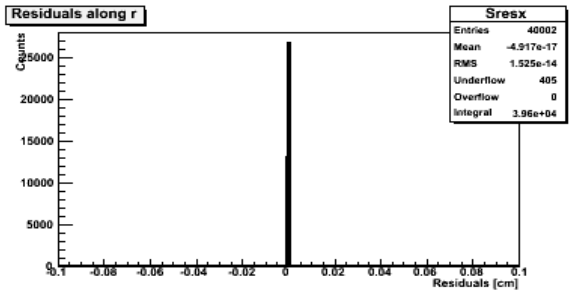

DPhi vs Z
Sresyvsz
Entries 40002
Mean x 0.06868
Mean y 0.02484
RMS x 39.07
RMS y 0.006457
Integral 3.955e+04
Residuals along Phi [rad]
Position along Z [cm]

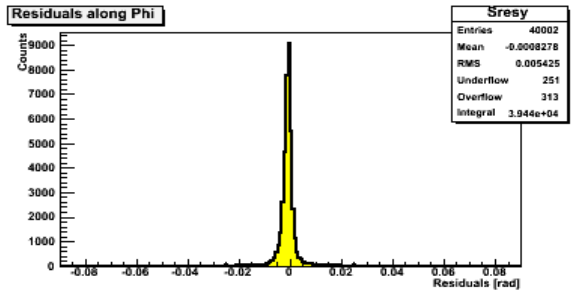

DZ vs Z
Sreszvsz
Entries 40002
Mean x 0.06432
Mean y -0.06319
RMS x 39
RMS y 0.7437
Integral 3.922e+04
Residuals along Z [cm]
Position along Z [cm]

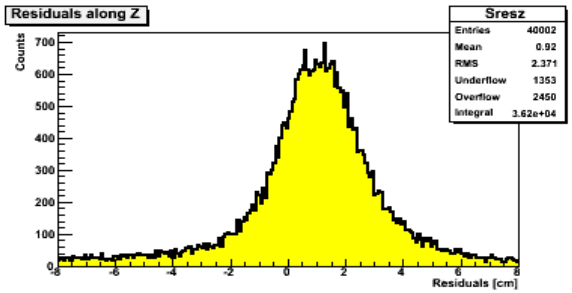

Residuals along x
diffx
Entries 40002
Mean 0.01146
RMS 0.228
Underflow 787
Overflow 779
Integral 3.844e+04
Counts
Residuals [cm]

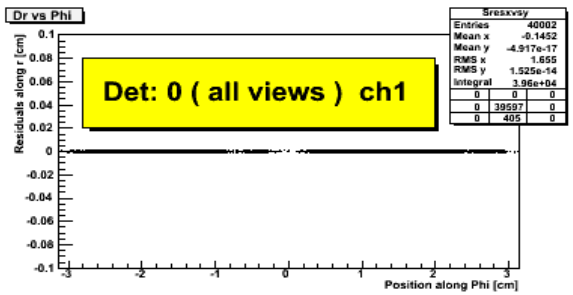

Residuals along y
diffy
Entries 40002
Mean 0.01022
RMS 0.1346
Underflow 476
Overflow 483
Integral 3.904e+04
Counts
Residuals [cm]

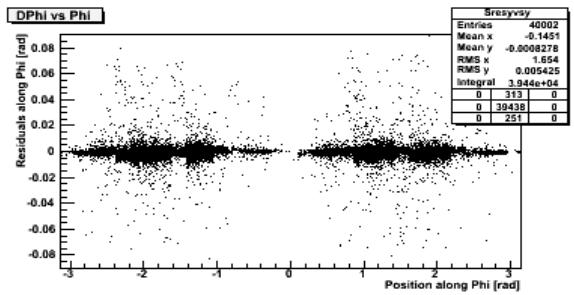

Residuals along z
diffz
Entries 40002
Mean 0.92
RMS 2.371
Underflow 1353
Overflow 2450
Integral 3.62e+04
Counts
Residuals [cm]

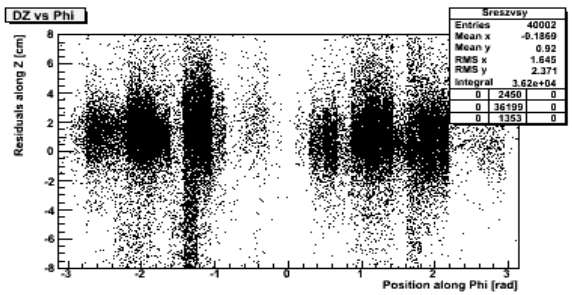

Residuals along r
Sresx
Entries 40002
Mean -4.917e-17
RMS 1.525e-14
Underflow 405
Overflow 0
Integral 3.96e+04
Counts
Residuals [cm]

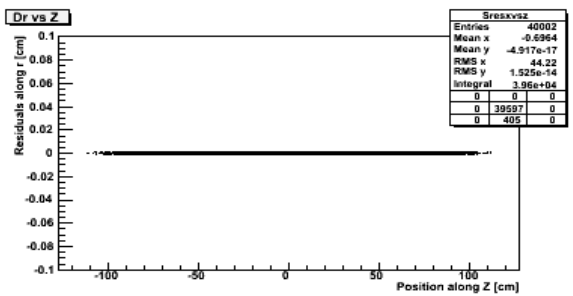

Residuals along Phi
Sresy
Entries 40002
Mean -0.0008278
RMS 0.005425
Underflow 251
Overflow 313
Integral 3.944e+04
Counts
Residuals [rad]

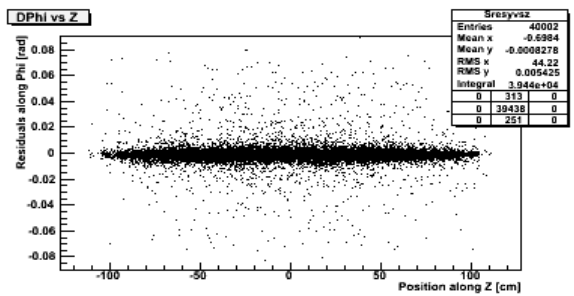

Residuals along Z
Sresz
Entries 40002
Mean 0.92
RMS 2.371
Underflow 1353
Overflow 2450
Integral 3.62e+04
Counts
Residuals [cm]

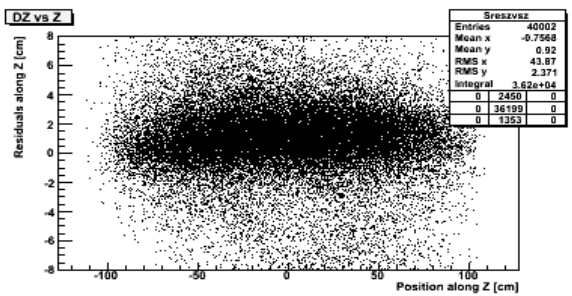

Dr vs Phi
Sresxvsy
Entries 40002
Mean x -0.1452
Mean y -4.917e-17
RMS x 1.655
RMS y 1.525e-14
Integral 3.96e+04
Det: 0 (all views) ch1
Residuals along r [cm]
Position along Phi [cm]

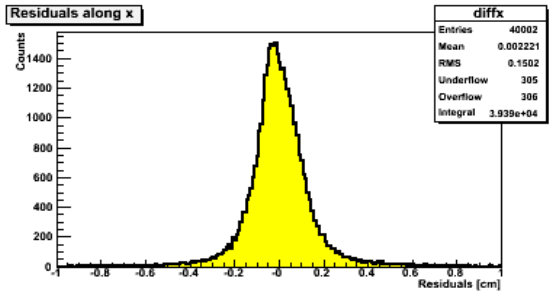

DPhi vs Phi
Sresyvsy
Entries 40002
Mean x -0.1451
Mean y -0.0008278
RMS x 1.654
RMS y 0.005425
Integral 3.944e+04
Residuals along Phi [rad]
Position along Phi [rad]

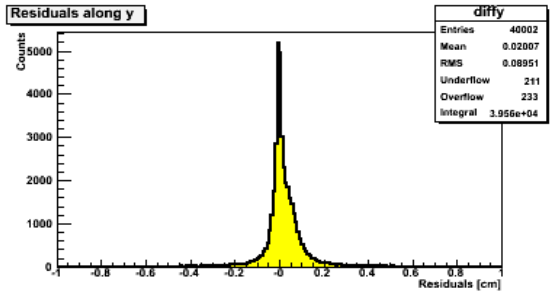

DZ vs Phi
Sreszvsy
Entries 40002
Mean x -0.1869
Mean y 0.92
RMS x 1.645
RMS y 2.371
Integral 3.62e+04
Residuals along Z [cm]
Position along Phi [rad]

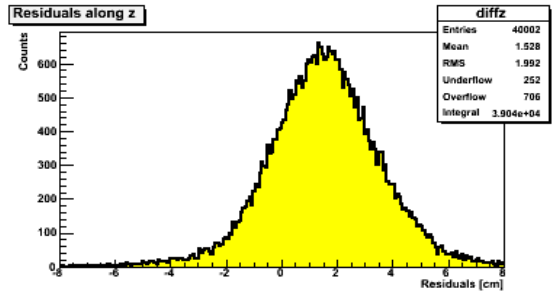

Dr vs Z
Sresxvsz
Entries 40002
Mean x -0.6964
Mean y -4.917e-17
RMS x 44.22
RMS y 1.525e-14
Integral 3.96e+04
Residuals along r [cm]
Position along Z [cm]

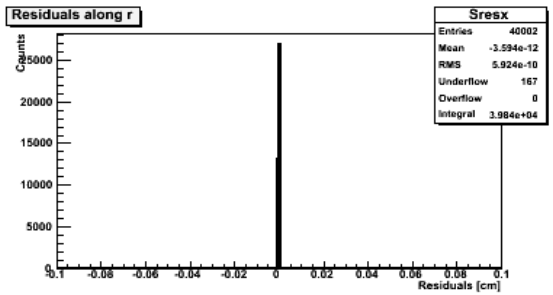

DPhi vs Z
Sresyvsz
Entries 40002
Mean x -0.6984
Mean y -0.0008278
RMS x 44.22
RMS y 0.005425
Integral 3.944e+04
Residuals along Phi [rad]
Position along Z [cm]

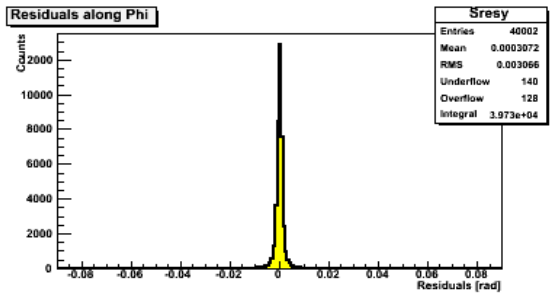

DZ vs Z
Sreszvsz
Entries 40002
Mean x -0.7568
Mean y 0.92
RMS x 43.87
RMS y 2.371
Integral 3.62e+04
Residuals along Z [cm]
Position along Z [cm]

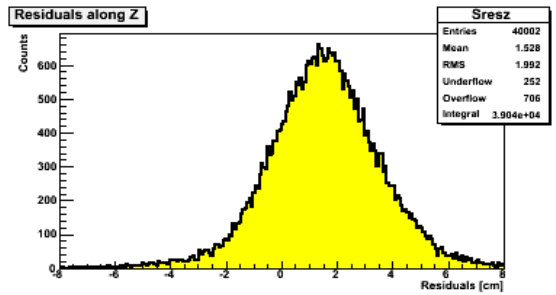

Residuals along x
diffx
Entries 40002
Mean 0.002221
RMS 0.1502
Underflow 305
Overflow 306
Integral 3.939e+04
Counts
Residuals [cm]

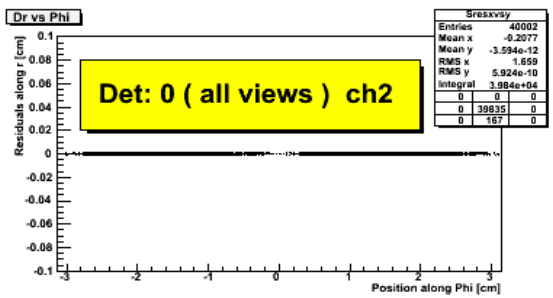

Residuals along y
diffy
Entries 40002
Mean 0.02007
RMS 0.08951
Underflow 211
Overflow 233
Integral 3.956e+04
Counts
Residuals [cm]


Residuals along z
diffz
Entries 40002
Mean 1.528
RMS 1.992
Underflow 252
Overflow 706
Integral 3.904e+04
Counts
Residuals [cm]

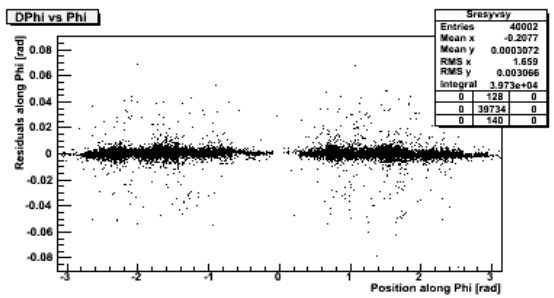

Residuals along r
Sresx
Entries 40002
Mean -3.594e-12
RMS 5.924e-10
Underflow 167
Overflow 0
Integral 3.984e+04
Counts
Residuals [cm]

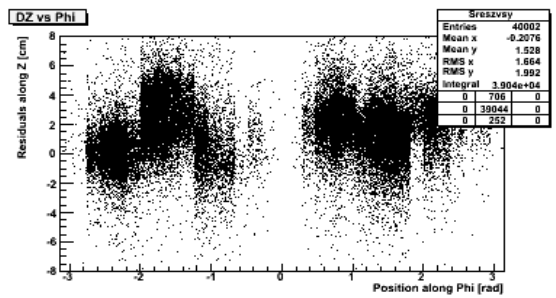

Residuals along Phi
Sresy
Entries 40002
Mean 0.0003072
RMS 0.003066
Underflow 140
Overflow 128
Integral 3.973e+04
Counts
Residuals [rad]

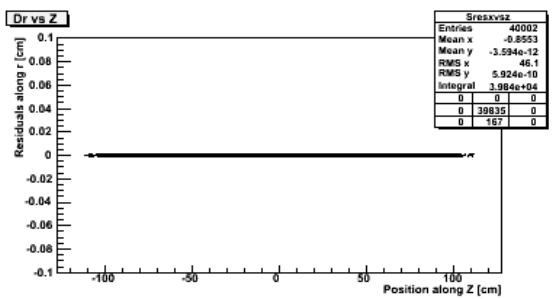

Residuals along Z
Sresz
Entries 40002
Mean 1.528
RMS 1.992
Underflow 252
Overflow 706
Integral 3.904e+04
Counts
Residuals [cm]

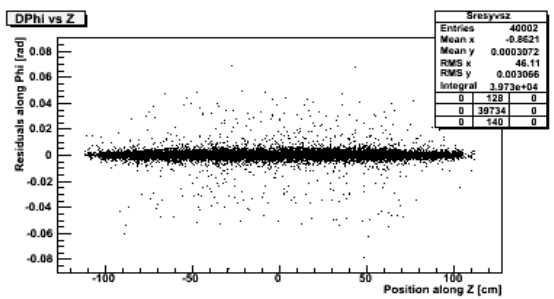

Dr vs Phi
Sresxvsy
Entries 40002
Mean x -0.2077
Mean y -3.594e-12
RMS x 1.659
RMS y 5.924e-10
Integral 3.984e+04
Residuals along r [cm]
Position along Phi [cm]

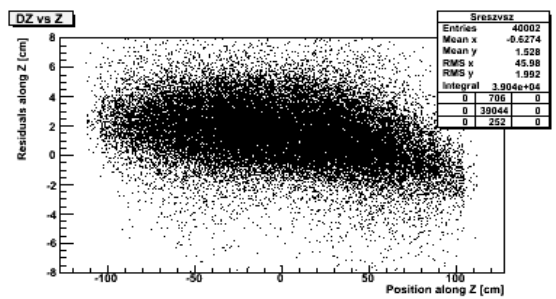
Det: 0 (all views) ch2

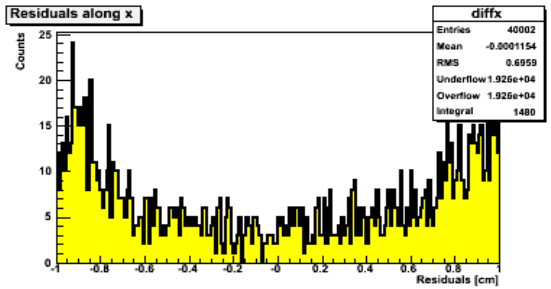

DPhi vs Phi
Sresyvsy
Entries 40002
Mean x -0.2077
Mean y 0.0003072
RMS x 1.659
RMS y 0.003066
Integral 3.973e+04
Residuals along Phi [rad]
Position along Phi [rad]

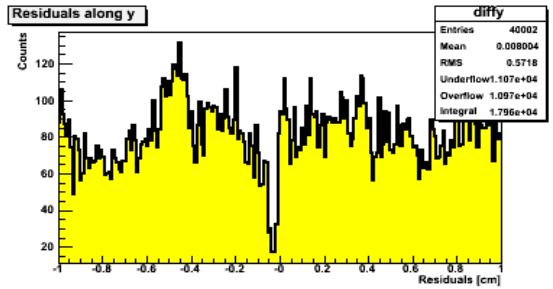

DZ vs Phi
Sreszvsy
Entries 40002
Mean x -0.2076
Mean y 1.528
RMS x 1.664
RMS y 1.992
Integral 3.904e+04
Residuals along Z [cm]
Position along Phi [rad]

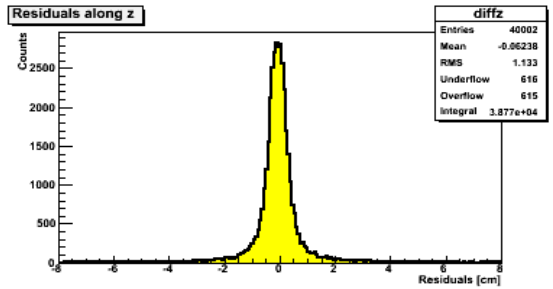

Dr vs Z
Sresxvsz
Entries 40002
Mean x -0.8553
Mean y -3.594e-12
RMS x 46.1
RMS y 5.924e-10
Integral 3.984e+04
Residuals along r [cm]
Position along Z [cm]

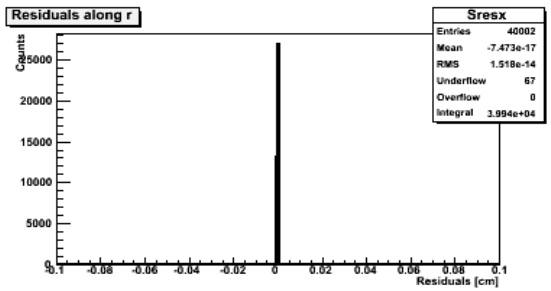

DPhi vs Z
Sresyvsz
Entries 40002
Mean x -0.8621
Mean y 0.0003072
RMS x 46.11
RMS y 0.003066
Integral 3.973e+04
Residuals along Phi [rad]
Position along Z [cm]

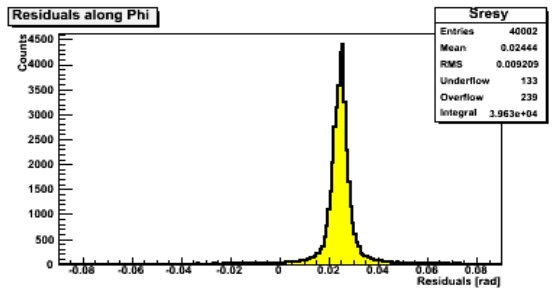

DZ vs Z
Sreszvsz
Entries 40002
Mean x -0.6274
Mean y 1.528
RMS x 45.98
RMS y 1.992
Integral 3.904e+04
Residuals along Z [cm]
Position along Z [cm]

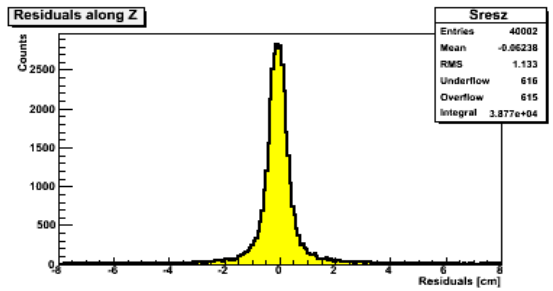

Residuals along x
diffx
Entries 40002
Mean -0.0001154
RMS 0.6959
Underflow 1.926e+04
Overflow 1.926e+04
Integral 1480
Counts
Residuals [cm]

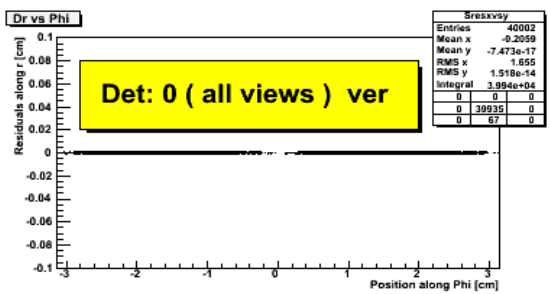

Residuals along y
diffy
Entries 40002
Mean 0.008004
RMS 0.5718
Underflow 1.107e+04
Overflow 1.097e+04
Integral 1.796e+04
Counts
Residuals [cm]

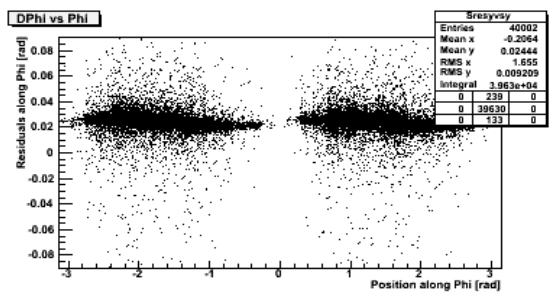

Residuals along z
diffz
Entries 40002
Mean -0.06238
RMS 1.133
Underflow 616
Overflow 615
Integral 3.877e+04
Counts
Residuals [cm]

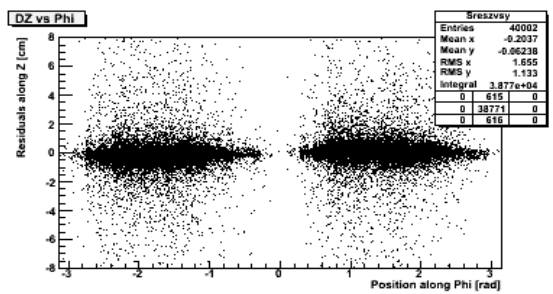

Residuals along r
Sresx
Entries 40002
Mean -7.473e-17
RMS 1.518e-14
Underflow 67
Overflow 0
Integral 3.994e+04
Counts
Residuals [cm]

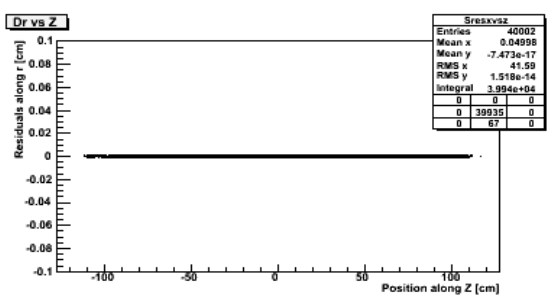

Residuals along Phi
Sresy
Entries 40002
Mean 0.02444
RMS 0.009209
Underflow 133
Overflow 239
Integral 3.963e+04
Counts
Residuals [rad]

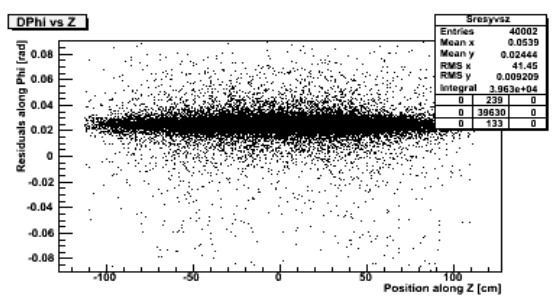

Residuals along Z
Sresz
Entries 40002
Mean -0.06238
RMS 1.133
Underflow 616
Overflow 615
Integral 3.877e+04
Counts
Residuals [cm]

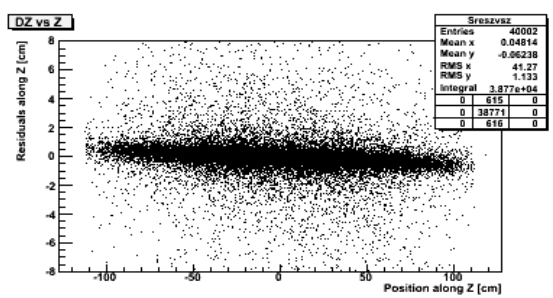

Dr vs Phi
Sresxvsy
Entries 40002
Mean x -0.2059
Mean y -7.473e-17
RMS x 1.655
RMS y 1.518e-14
Integral 3.994e+04
Det: 0 (all views) ver
Residuals along r [cm]
Position along Phi [cm]


DPhi vs Phi
Sresyvsy
Entries 40002
Mean x -0.2064
Mean y 0.02444
RMS x 1.655
RMS y 0.009209
Integral 3.963e+04
Residuals along Phi [rad]
Position along Phi [rad]


DZ vs Phi
Sreszvsy
Entries 40002
Mean x -0.2037
Mean y -0.06238
RMS x 1.655
RMS y 1.133
Integral 3.877e+04
Residuals along Z [cm]
Position along Phi [rad]


Dr vs Z
Sresxvsz
Entries 40002
Mean x 0.04998
Mean y -7.473e-17
RMS x 41.59
RMS y 1.518e-14
Integral 3.994e+04
Residuals along r [cm]
Position along Z [cm]


DPhi vs Z
Sresyvsz
Entries 40002
Mean x 0.0539
Mean y 0.02444
RMS x 41.45
RMS y 0.009209
Integral 3.963e+04
Residuals along Phi [rad]
Position along Z [cm]

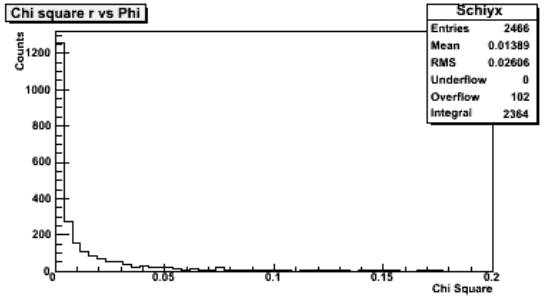

DZ vs Z
Sreszvsz
Entries 40002
Mean x 0.04814
Mean y -0.06238
RMS x 41.27
RMS y 1.133
Integral 3.877e+04
Residuals along Z [cm]
Position along Z [cm]

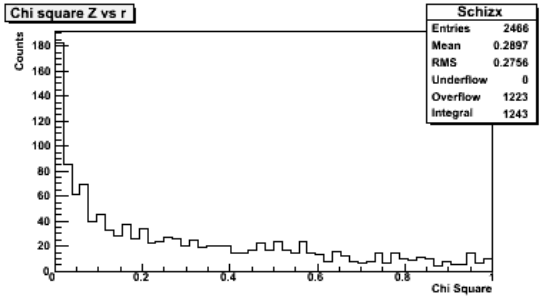
DCH ONLY road by road

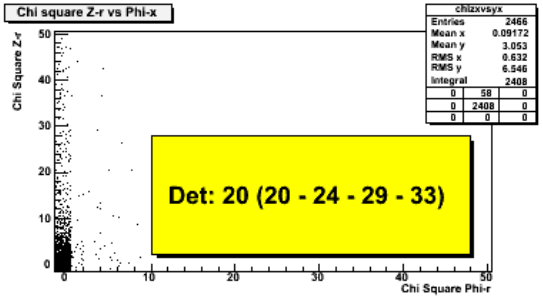
- Looking to one chamber fitting with the other three(to disantagle the misalignment contributions)→The DCH mechanical structure is the CLEPSYDRA, the fixed reference system in FINUDA SPECTROMETER.

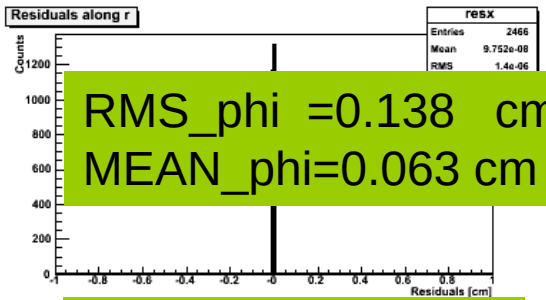
More populated roads:

- DC1_2- DC1_6-DC2_3-DC2_7 (20-24-29-33) 36.2%
- DC1_3-DC1_7-DC2_4-DC2_8 (21-25-30-34) 22.0%
- DC1_1-DC1_5-DC2_2-DC2_6 (19-23-28-32) 13.2%
- DC1_3-DC1_7-DC2_3-DC2_7 (21-25-29-33) 11.1%

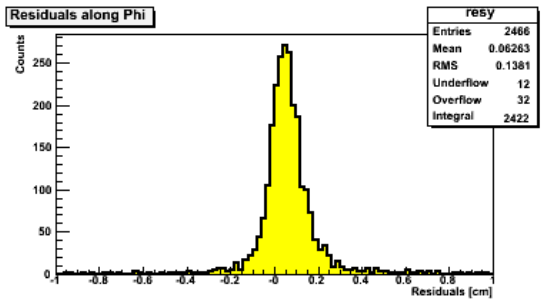


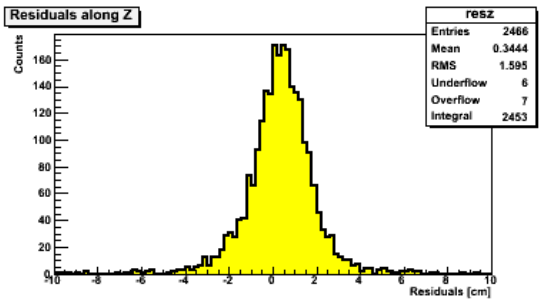




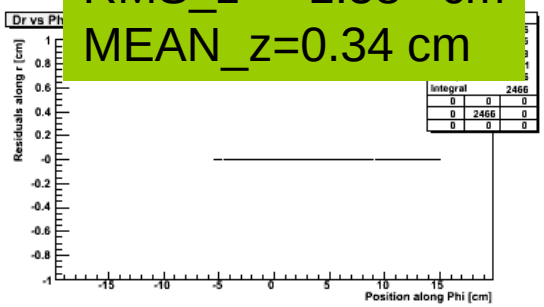


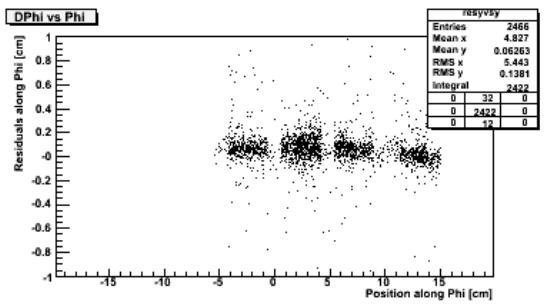
RMS_phi =0.138 cm
MEAN_phi=0.063 cm

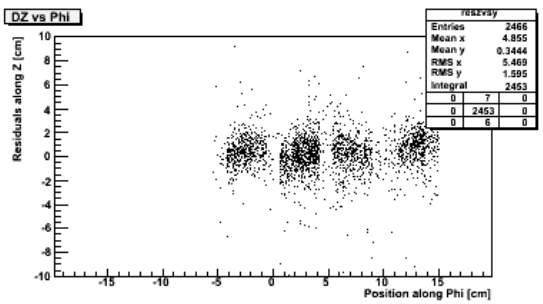


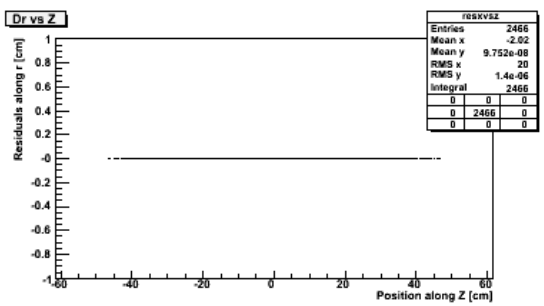


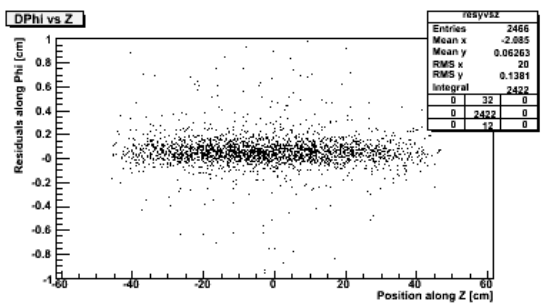
RMS_z = 1.58 cm
MEAN_z=0.34 cm

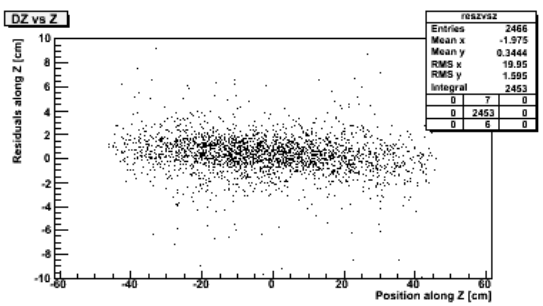






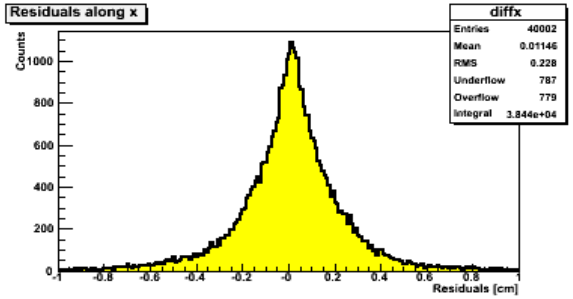


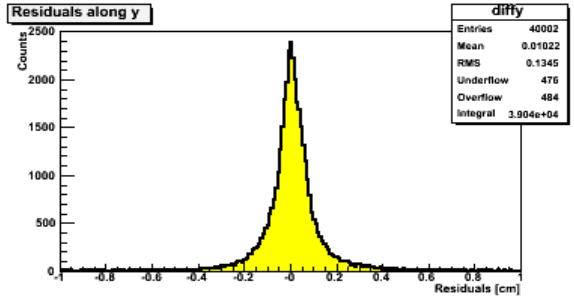


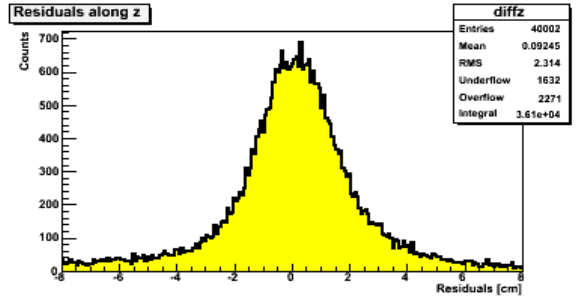


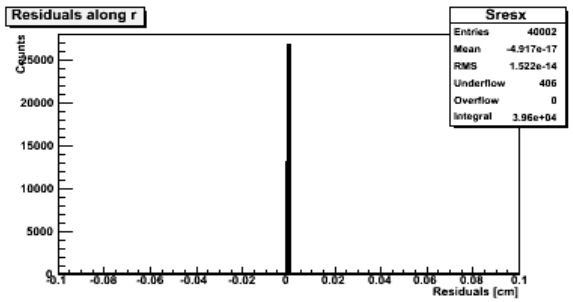
FIRST STEP:

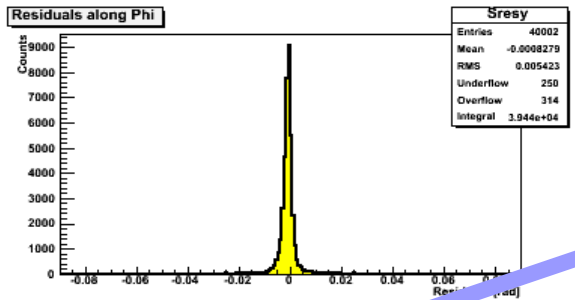
- Moving all together the DCH1 in z coordinate
- Moving all together the DCH2 in z coordinate
- Rotate all together the VERTEX (Phi angle) -1.4 °

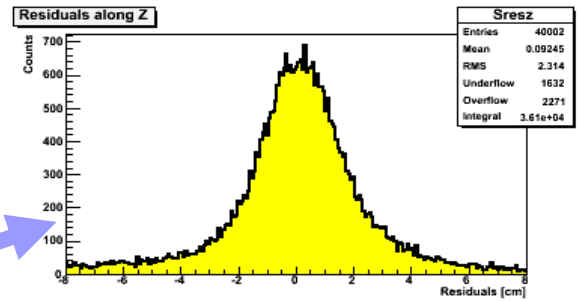


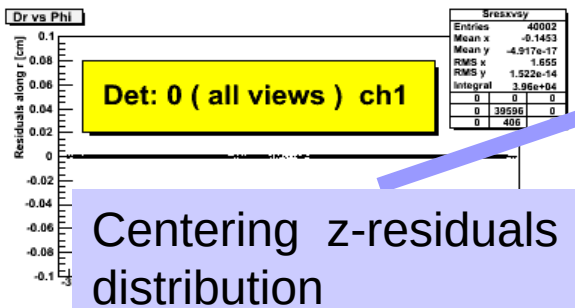


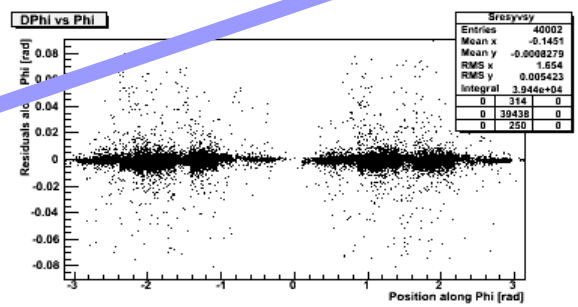


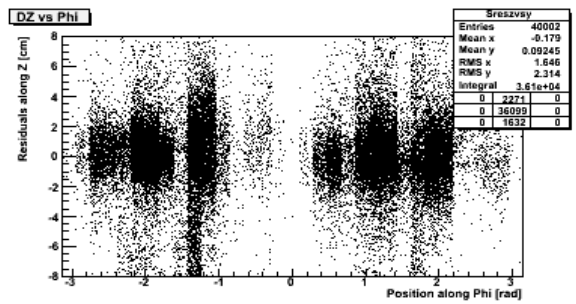




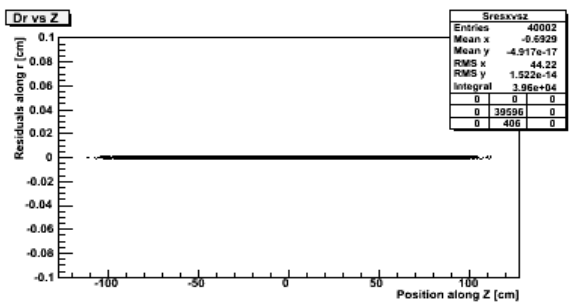


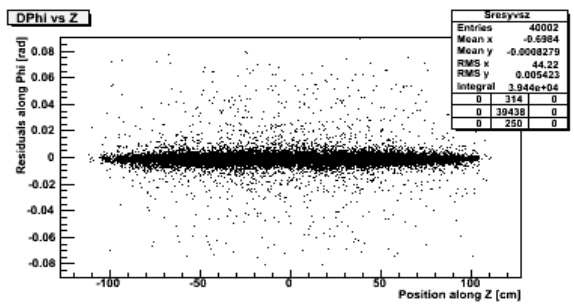


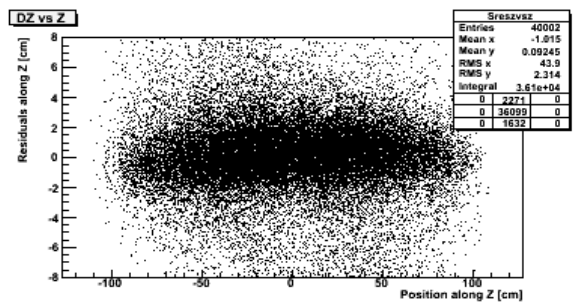


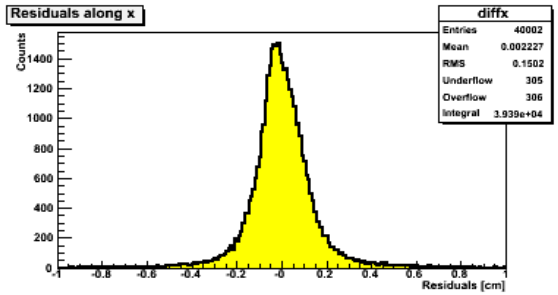


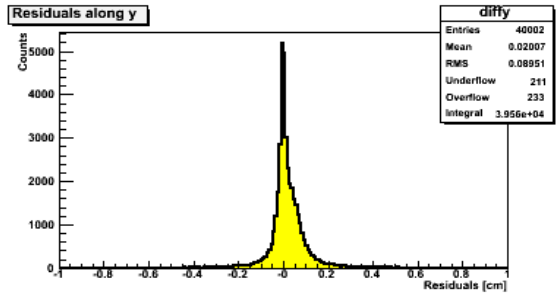
Centering z-residuals distribution

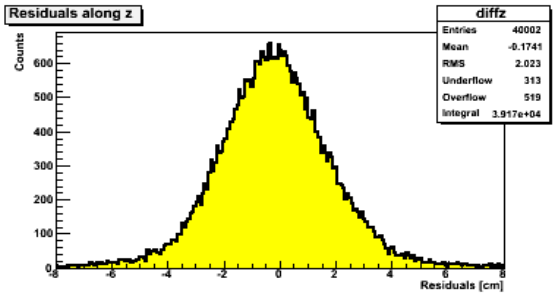


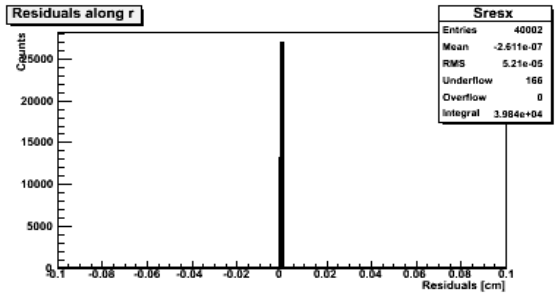


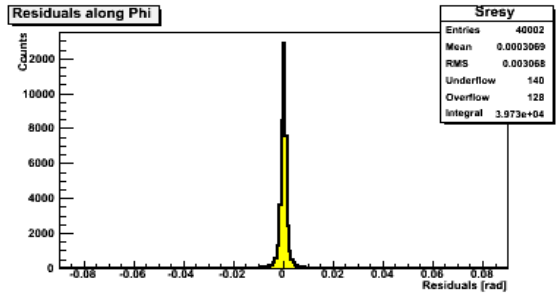


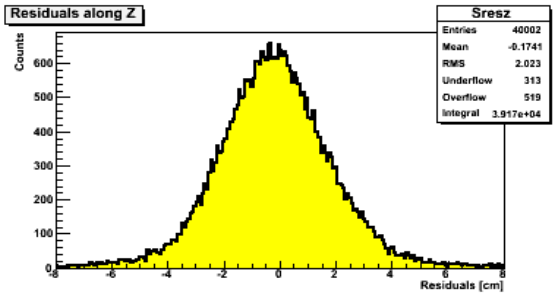

Residuals along x
diffx
Entries 40002
Mean 0.002227
RMS 0.1502
Underflow 305
Overflow 306
Integral 3.939e+04
Counts
Residuals [cm]

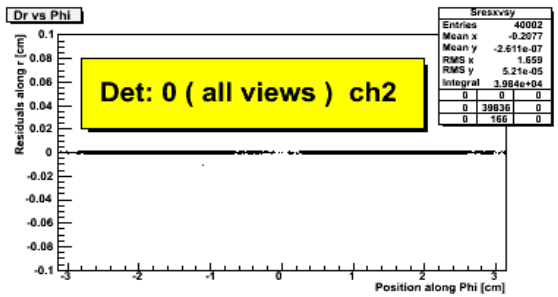

Residuals along y
diffy
Entries 40002
Mean 0.02007
RMS 0.08951
Underflow 211
Overflow 233
Integral 3.956e+04
Counts
Residuals [cm]

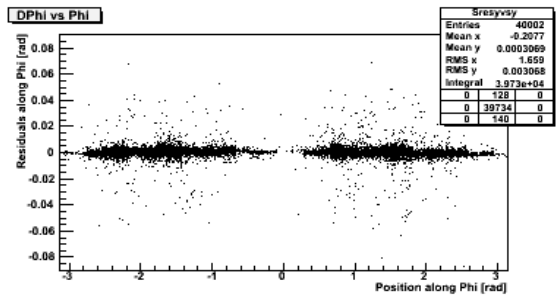

Residuals along z
diffz
Entries 40002
Mean -0.1741
RMS 2.023
Underflow 313
Overflow 519
Integral 3.917e+04
Counts
Residuals [cm]

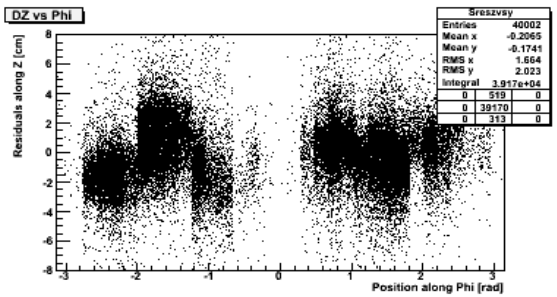

Residuals along r
Sresx
Entries 40002
Mean -2.611e-07
RMS 5.21e-05
Underflow 166
Overflow 0
Integral 3.984e+04
Counts
Residuals [cm]

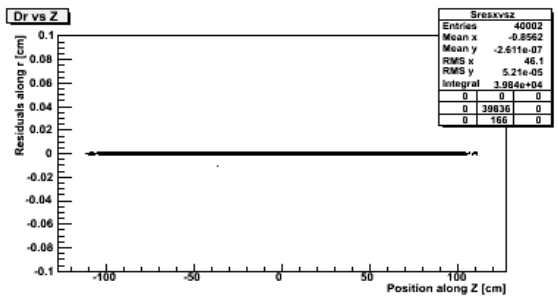

Residuals along Phi
Sresy
Entries 40002
Mean 0.0003069
RMS 0.003068
Underflow 140
Overflow 128
Integral 3.973e+04
Counts
Residuals [rad]

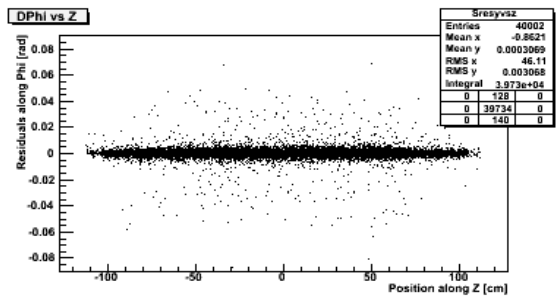

Residuals along Z
Sresz
Entries 40002
Mean -0.1741
RMS 2.023
Underflow 313
Overflow 519
Integral 3.917e+04
Counts
Residuals [cm]

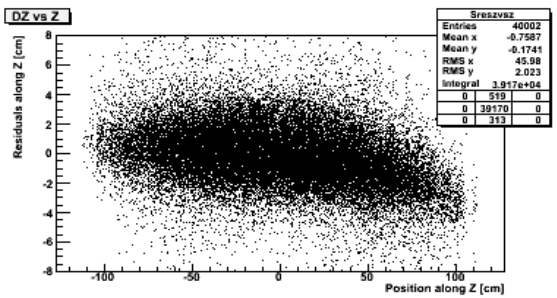

Dr vs Phi
Sresxvsy
Entries 40002
Mean x -0.2077
Mean y -2.611e-07
RMS x 1.659
RMS y 5.21e-05
Integral 3.984e+04
Det: 0 (all views) ch2
Residuals along r [cm]
Position along Phi [cm]

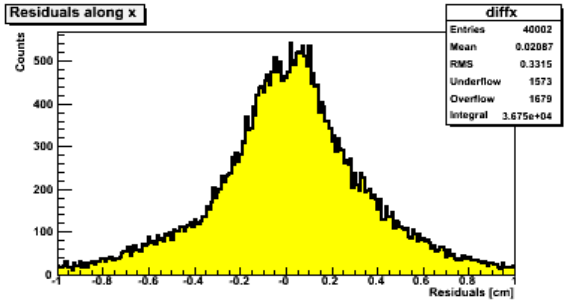

DPhi vs Phi
Sresyvsy
Entries 40002
Mean x -0.2077
Mean y 0.0003069
RMS x 1.659
RMS y 0.003068
Integral 3.973e+04
Residuals along Phi [rad]
Position along Phi [rad]

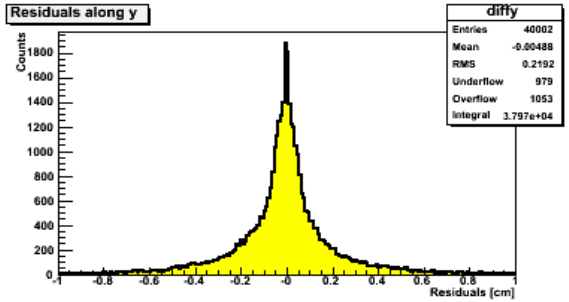

DZ vs Phi
Sreszvsy
Entries 40002
Mean x -0.2065
Mean y -0.1741
RMS x 1.664
RMS y 2.023
Integral 3.917e+04
Residuals along Z [cm]
Position along Phi [rad]

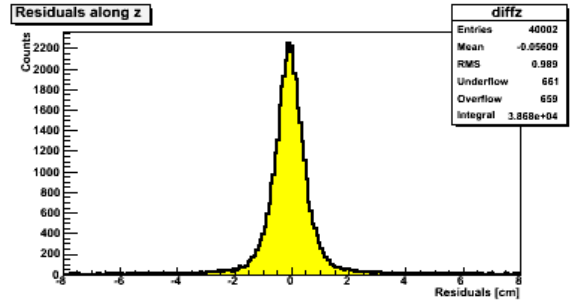

Dr vs Z
Sresxvsz
Entries 40002
Mean x -0.8562
Mean y -2.611e-07
RMS x 46.1
RMS y 5.21e-05
Integral 3.984e+04
Residuals along r [cm]
Position along Z [cm]

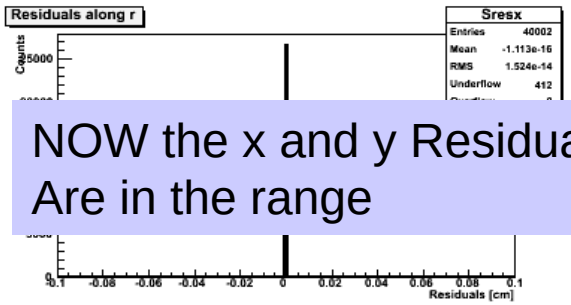

DPhi vs Z
Sresyvsz
Entries 40002
Mean x -0.8621
Mean y 0.0003069
RMS x 46.11
RMS y 0.003068
Integral 3.973e+04
Residuals along Phi [rad]
Position along Z [cm]


DZ vs Z
Sreszvsz
Entries 40002
Mean x -0.7587
Mean y -0.1741
RMS x 45.98
RMS y 2.023
Integral 3.917e+04
Residuals along Z [cm]
Position along Z [cm]

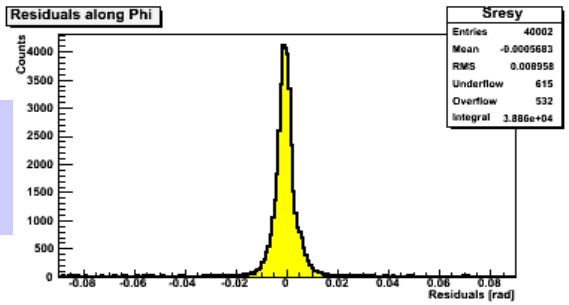


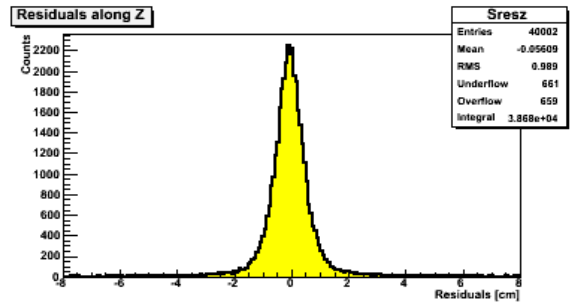


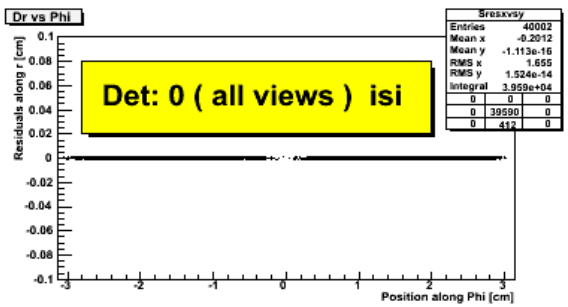




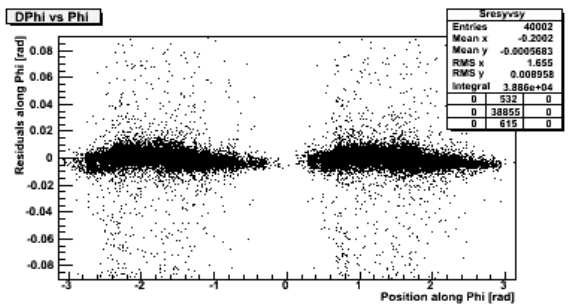
NOW the x and y Residuals
Are in the range

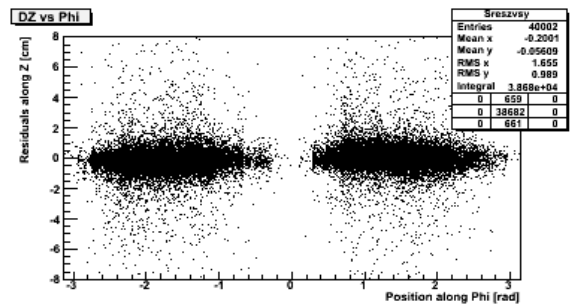


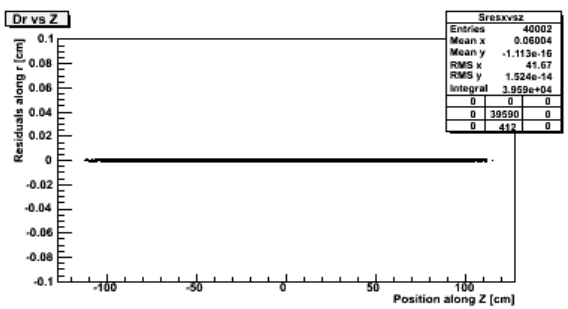


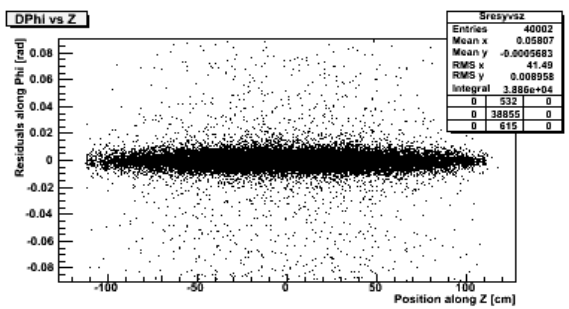


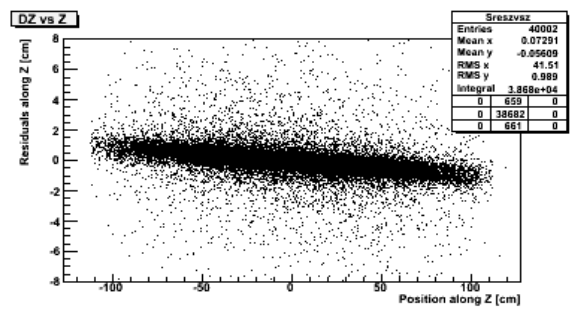
Det: 0 (all views) isi

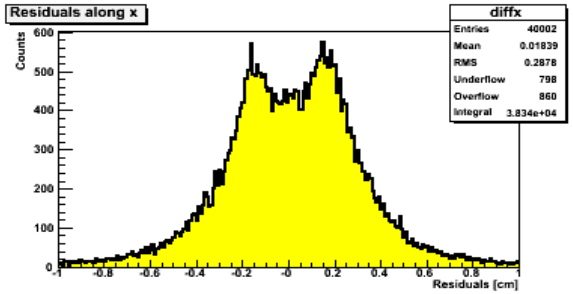


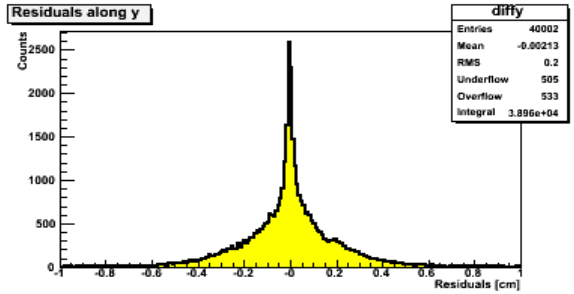


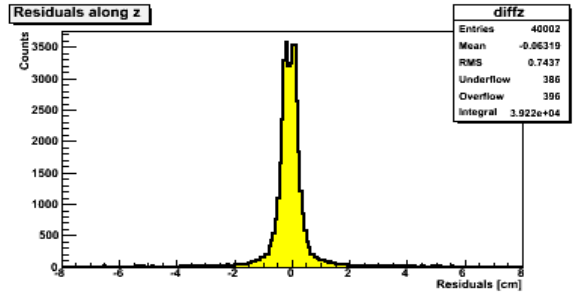


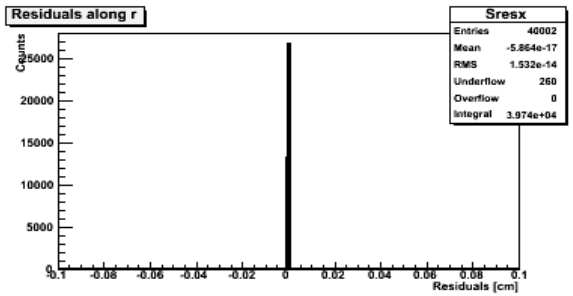


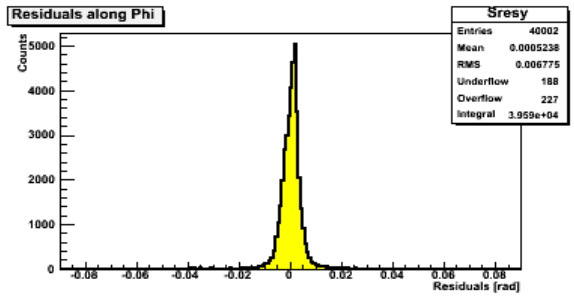


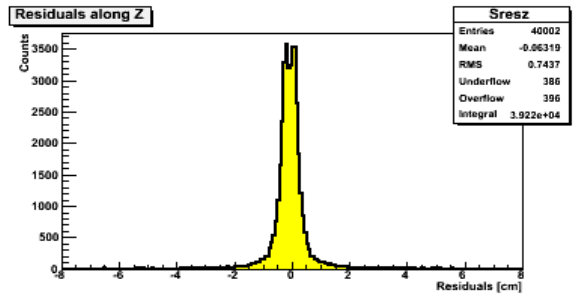


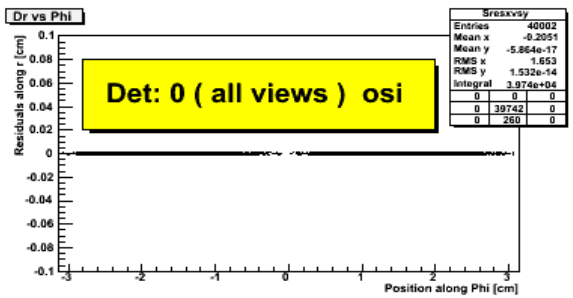


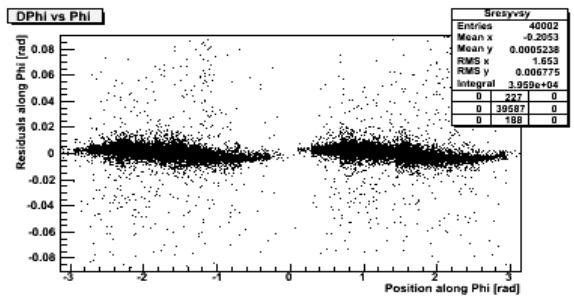


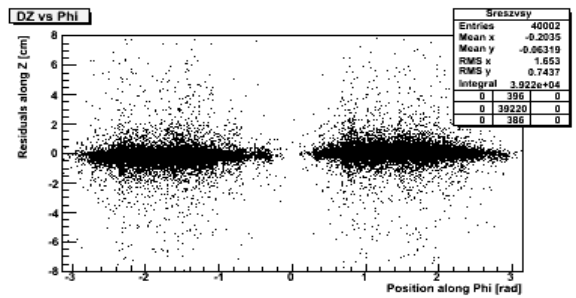




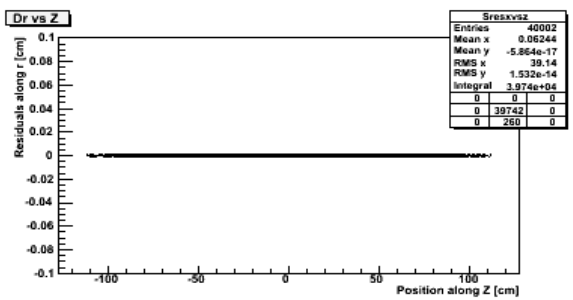


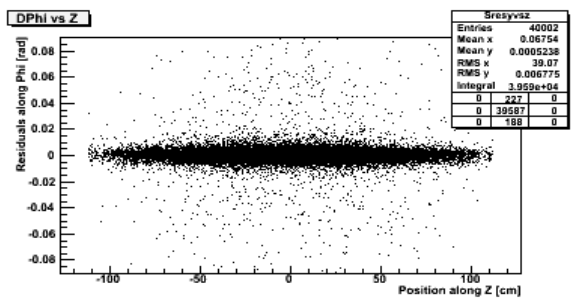


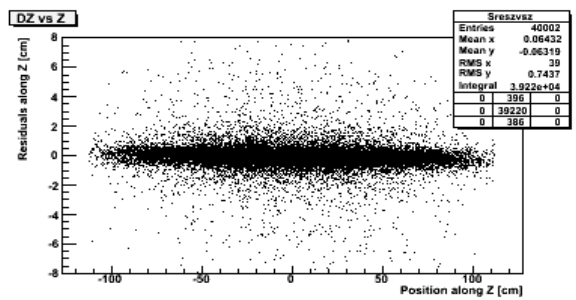


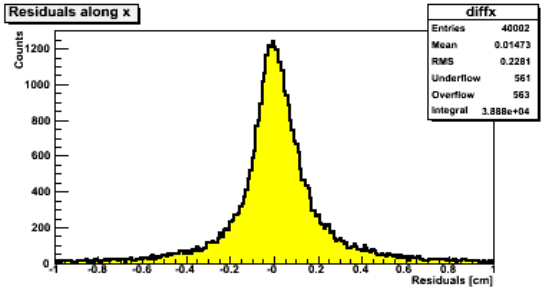


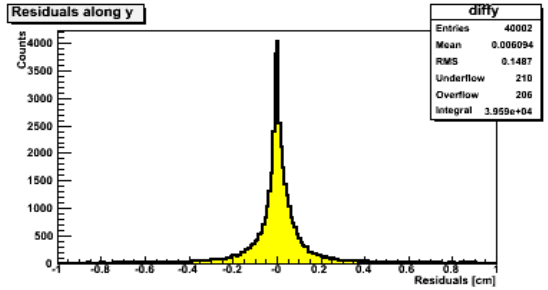
Det: 0 (all views) osi

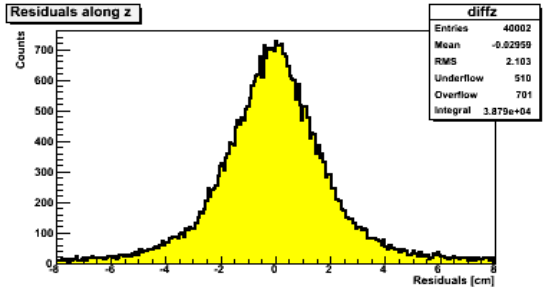


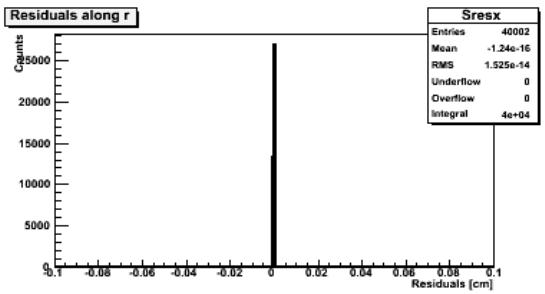


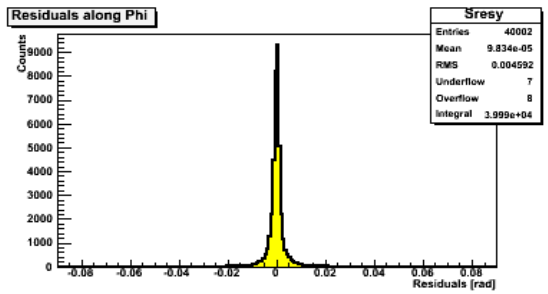


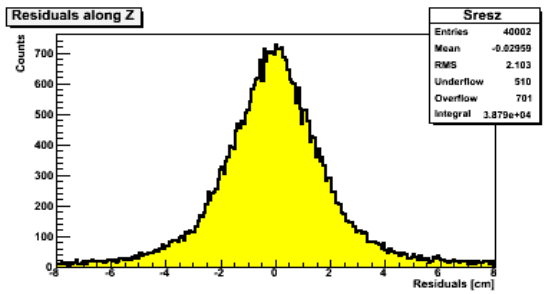


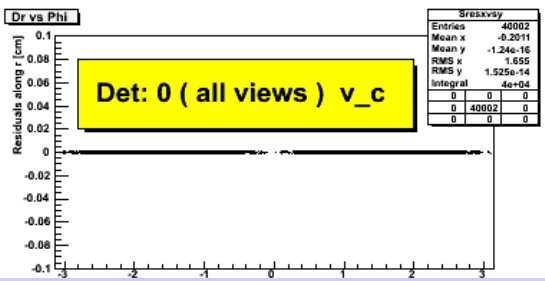


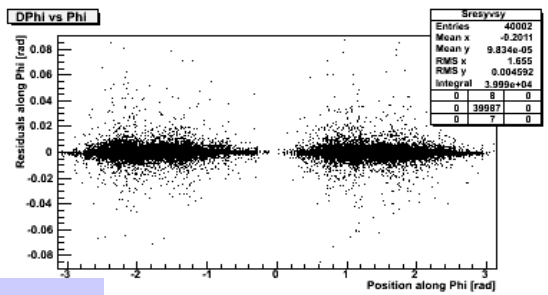


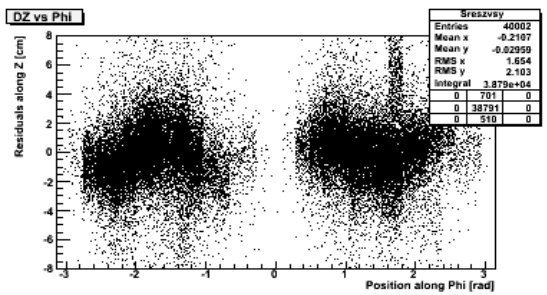




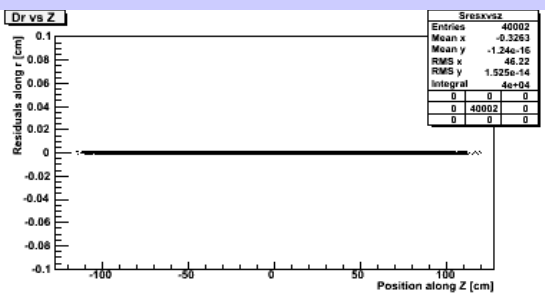


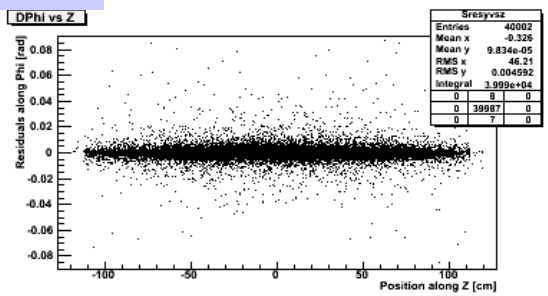


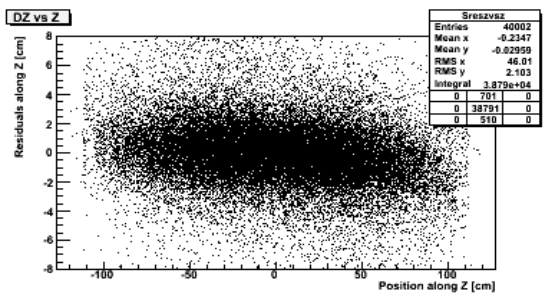




Fitting with chambers and vertex







PLAN

- Increase the statistics with recent cosmics B OFF
- Clean the data set (no bad TDC flag)
- Insertion of first step vertex alignment
- Take care of other global translations and rotations
- Take care of single detector translations and rotations