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COMPASS

STANDARD ALIGNMENT PROCEDURE

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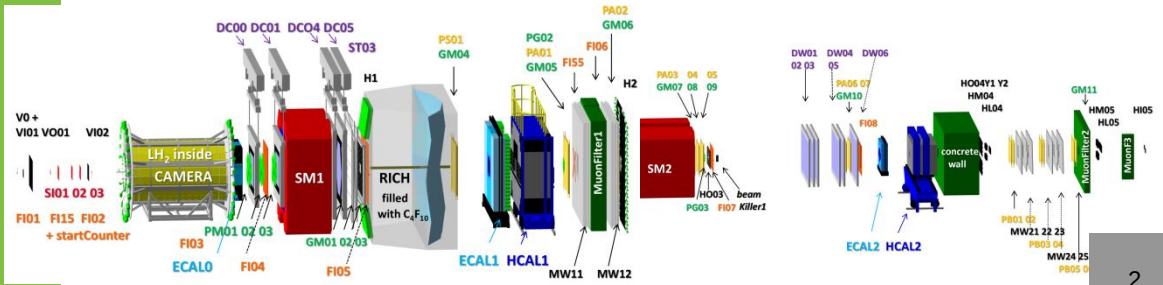
Standard alignment procedure

- The first step - alignment using the run with the magnetic field off;
- Do not align:
  - ✓ FI07, FI08, GM10, GM11 (they are located along beam path with the magnetic field on);
  - ✓ Pixel Micromegas and Pixel GM (small number of statictics);
  - ✓ V H ST*****a ST*****c



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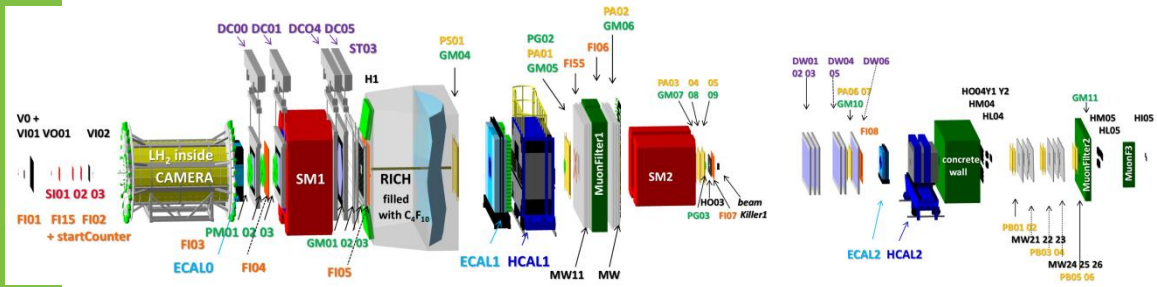
Standard alignment procedure

- The second step – alignment field on, we exclude detectors in the beam telescope;
- The third step – alignment field on, all the detectors except the beam telescope ones are fixed;

✓ Do not align V H ST*****a ST*****c



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Standard alignment procedure (magnets off)

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Main switches in traf.*.opt and align.*.opt files

include ${CORAL}/src/user/trafdic.2016.opt - the original file for traf procedures (obligatory)

TraF DetNameOff BM MA MB H V ST03***a ST03***c (outer parts of Straw) GM11 FI08.

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align excludeDets BM H V FI08 GM10 GM11 SI FI01 FI15 FI02 (detectors we exclude for alignment)

align useDets GM FI GP MP ST PA PB PS DC MA MB DW (detectors we use for alignment)

fix U GM04X1 GM04Y1 GM09X1 GM09Y1 (fixed detectors and their planes)

MWPC, Straw, W45. SI – it is hard to catch peaks, so it is possible to artificially reduce their resolution.

TraF dCut [84] .0050 // SI position uncertainties correction term (when badly aligned)

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Standard alignment procedure (magnets off)

Approximate procedure of alignment for magnets off

- GEM
- FI (not FI01, FI02, FI15)
- PI MicroMegas
- MWPC
- DC, Straw
- W45
- MW1, MW2

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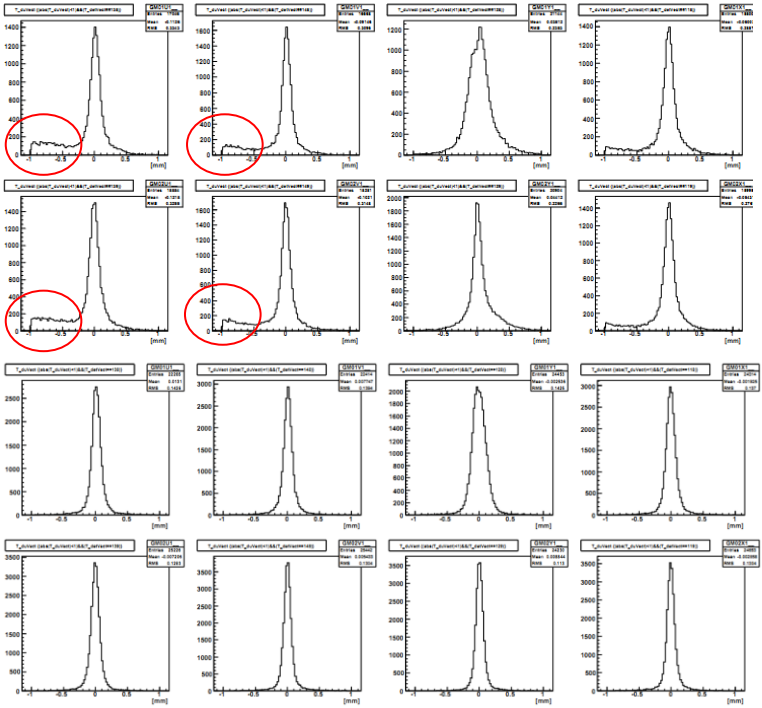
Standard alignment procedure (magnets off). Examples



Problems with earlier runs – peaks are without “tails” but not centered at 0.

Run 274687 (W12)

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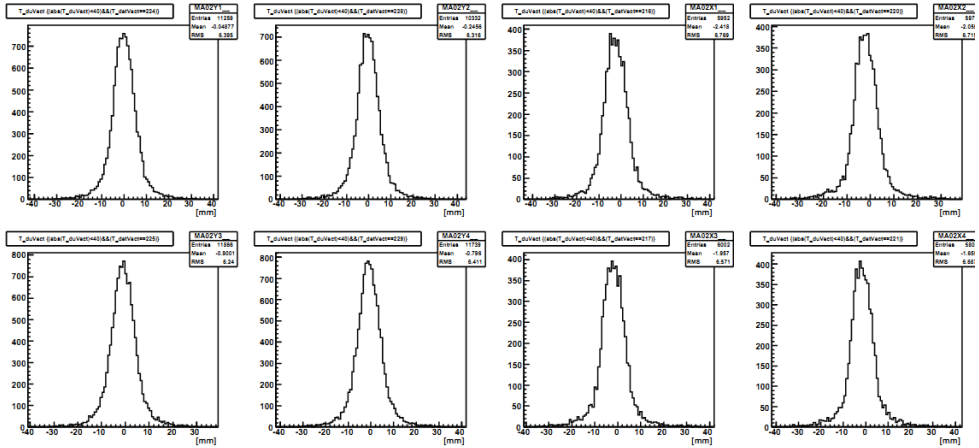
Standard alignment procedure (magnets off).Examples



Old alignment procedure or more iterations should be applied

MA02Y1__	+0.064263	+0.54684
MA02Y2__	+1.6990	+0.53692
MA02X1__	+3.1931	+0.54271
MA02X2__	+5.2055	+0.51987
MA02Y3__	-4.1640	+0.53513
MA02Y4__	-2.6902	+0.55938
MA02X3__	-0.93672	+0.53692
MA02X4__	-0.98719	+0.54672

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Standard alignment procedure (magnets on)

- AddOffset Function adds Lorentz corrections when performing alignment magnets on.

  geotmp=$ALIHOME/geometry/detectors.$YEAR.$per.aloff.addoffset.dat

  ./scripts/LorentzCorrTuned2016.csh $geostart OFF $geotmp ON- &> $ALIHOME/dico/addoffset.txt
- We exclude detectors, for which we have no calibration or detectors having bad planes.
- MA, MB are excluded when other detectors are aligned, because they have lower resolution [e.g. Marcia Margarida Varanda Quaresma Transverse Momentum Dependent Parton Distribution Functions through SIDIS and Drell-Yan at COMPASS]

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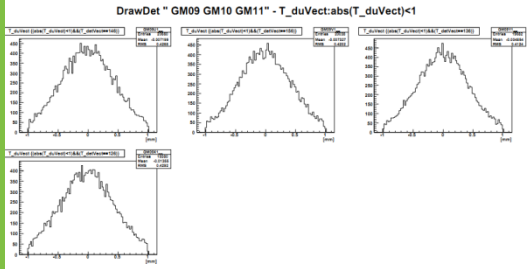
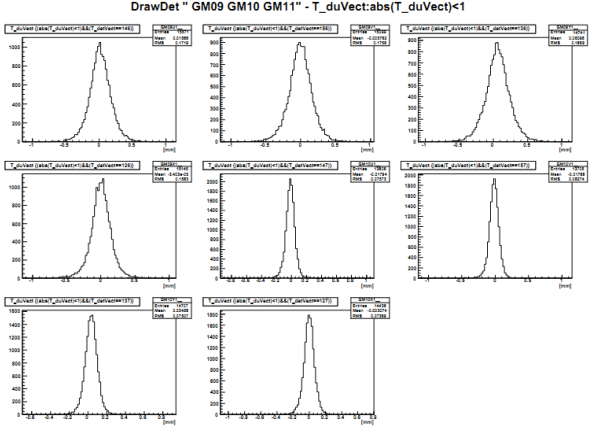
Standard alignment procedure (magnets on)





Magnets off

Run 274687
(W12)

Magnets on

Run 274688
(W12)

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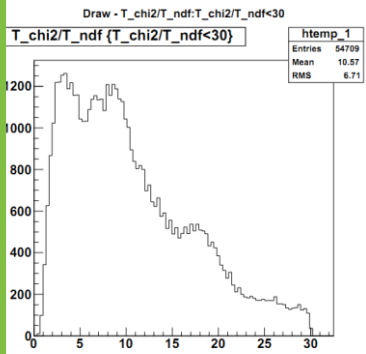
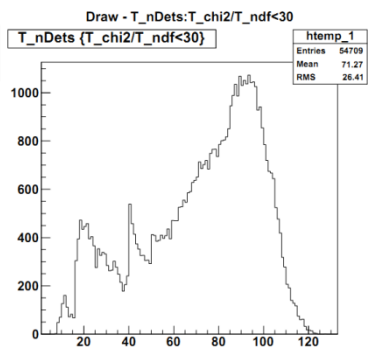
Problems

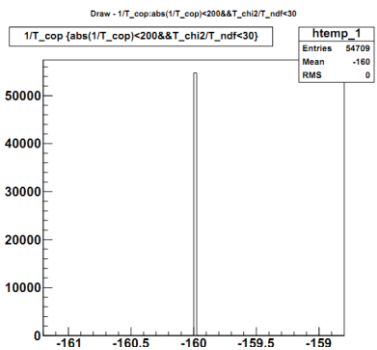
- Alignment procedure for earlier runs;
- Matching of detectors **TraF DetNameOff**, **align excludeDets** and **align useDets;**
- Alignment of angles and pithes;
- Is there any “ideal” alignment?

Problems

What is the mean of the graphs?







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THANK YOU FOR YOUR ATTENTION!