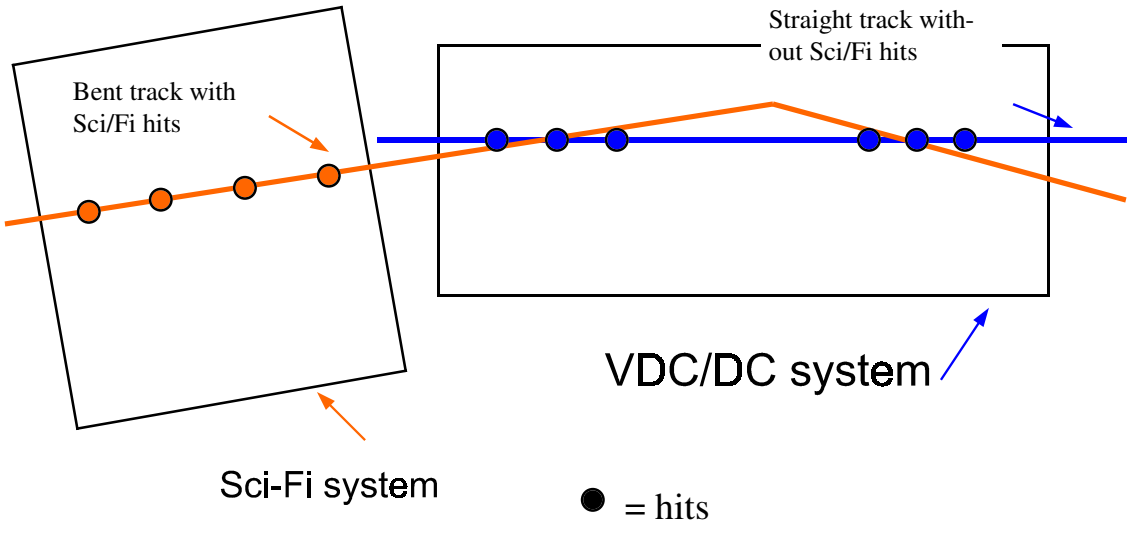
SPECTROMETER ALIGNMENT

The original problem

The scintillating fibers and the drift chambers were not well aligned. The two plots with 200+ events show the problem. Plotted are the calculated momenta for straight muons (PW5 run, ROSIE off). If everything is ok one would expect a Gaussian around 0. This is the case for VDC+DC only, but including Sci/Fi hits results in an offset. Looking at the residuals in the different stations leads to the following picture:



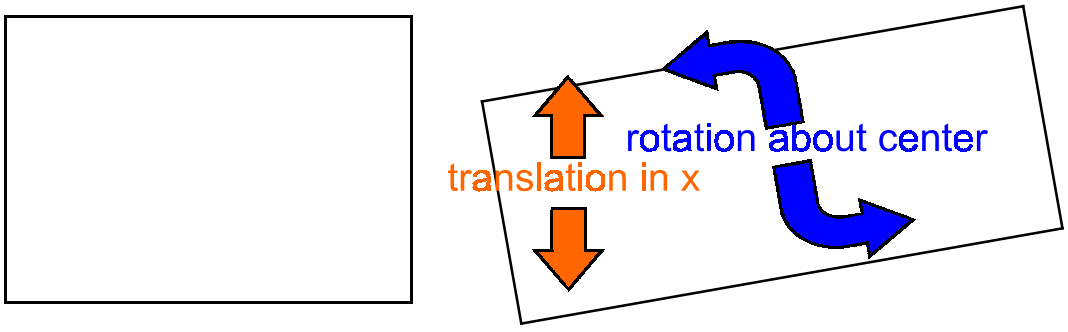
The alignment method

The best way to do it would be to realign the scintillating fiber planes individually, because there seems to be an internal misalign ment problem as well (mean of residual varies a lot).

But: We can't do that (vertex finding).

So we have to move the drift chambers instead.

Because the alignment between VDC and DC has to be preserved, there are only two degrees of freedom – rotation and translation of the whole drift chamber system with respect to the Sci/Fi planes.

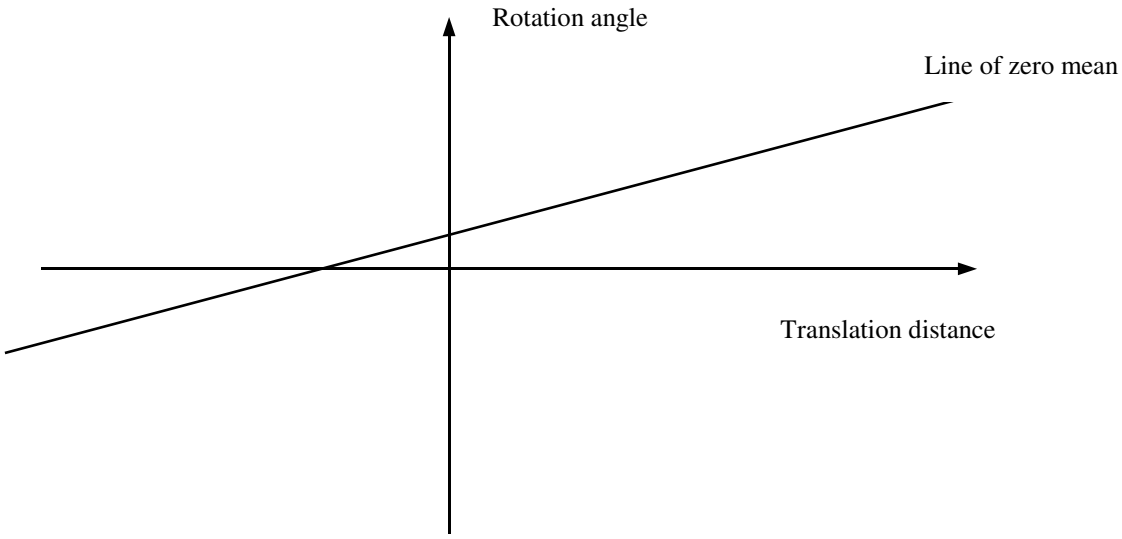


Sci-Fi system

VDC/DC system

Results:

Re-analyzing tape events with varying rotation and translation parameters gives the following picture:



There is a line of zero mean in parameter space on which the minimum width (sigma/RMS) of the 1/p-distribution has to be found. The results are displayed in the *excel*-plots. The minima for RMS and sigma are < .1 mm (offset) apart. The 1/p distribution for different combinations of systems are shown in the PAW 400+ event plots.