Fiber-Si Alignment and MC

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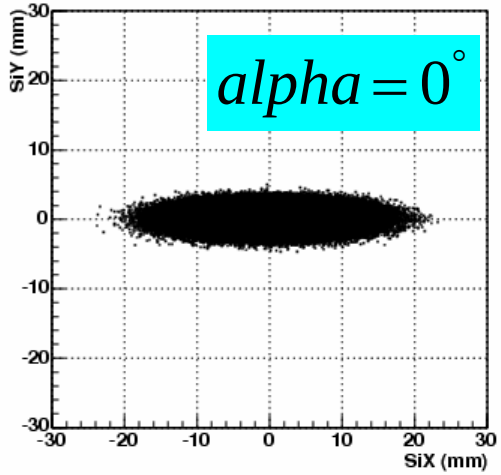
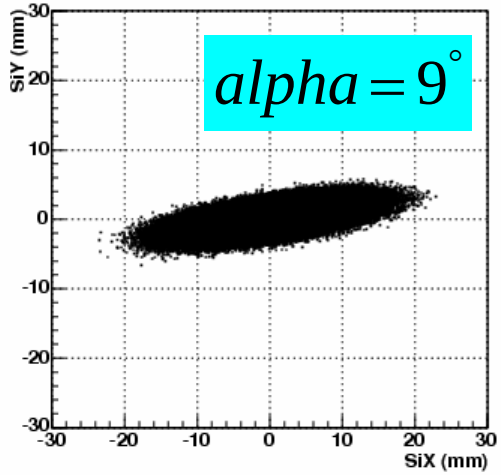
Toy simulation

2-Dimensional distribution generated by random number with Gaussian

$\sigma_x = 5.0mm, \sigma_y = 1.0mm$

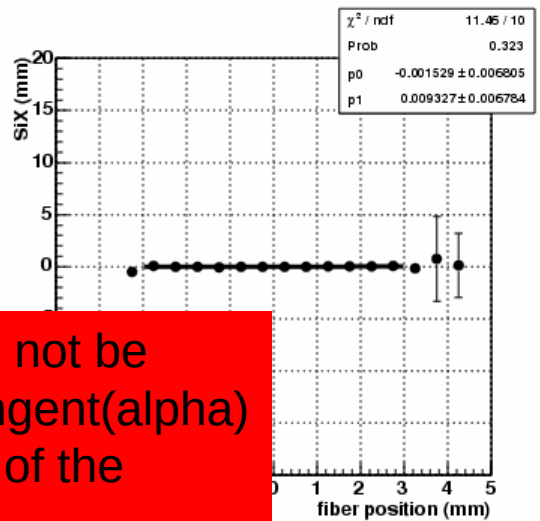
Ellipse from SiX-SiY

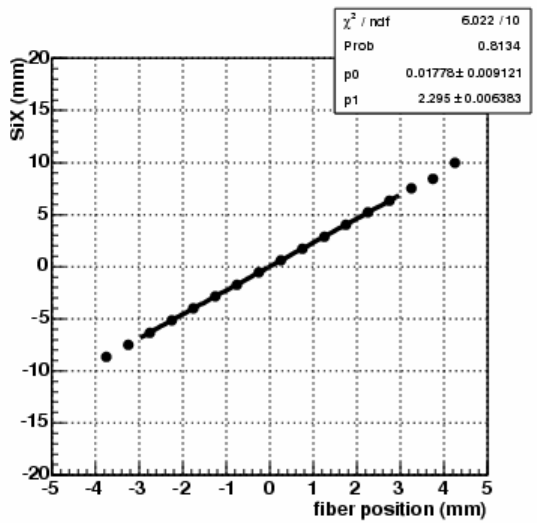




2-D distribution is projected to SiX.

Correlation from Fiber-SiX

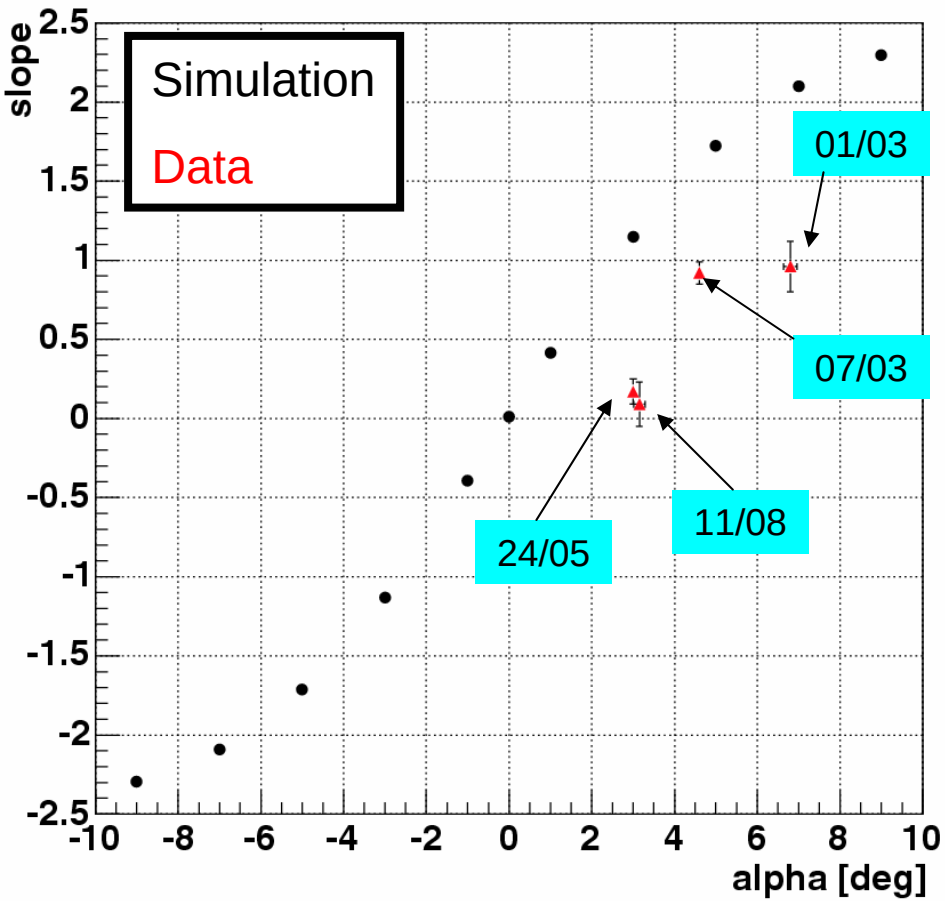




alpha : slope	
0	: 0.01
9	: 2.30

slope from fiber can not be compared to the tangent(alpha) with linear because of the geometry of ellipse

Comparison Toy simulation and Data



alpha from ellipse fit and slope from Fiber-SiX with real data.

date	alpha	slope
01/03	6.8±0.3	0.96±0.16
07/03	4.6±0.1	0.92±0.17
24/05	3.0±0.1	0.17±0.08
11/08	3.2±0.2	0.09±0.14

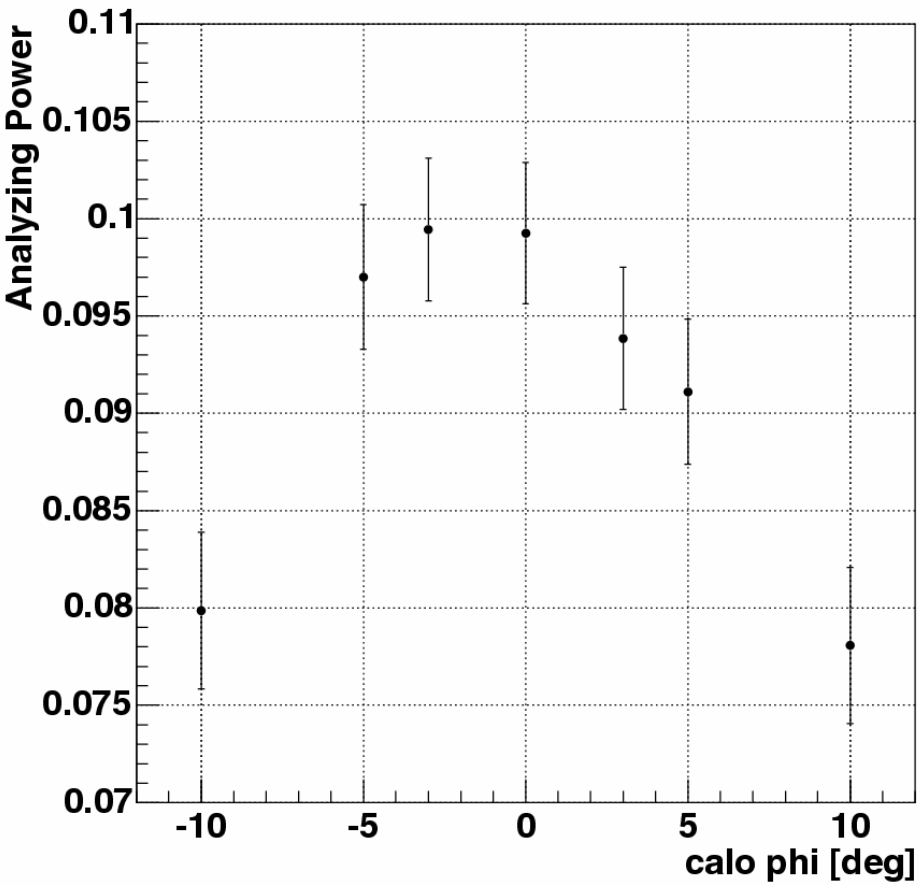
The trend of both Simulation and Data respectively are almost same.

HERA beam was tilted in March?

If so, how affect on the polarisation measurement?

AP .vs. phi of CAL (beam tilt)

Rotate CAL phi instead of beam tilt



each 100,000 events generated

Analyzing Power is sensitive to the tilt between CAL and beam.

Should measure the beam tilt every time?

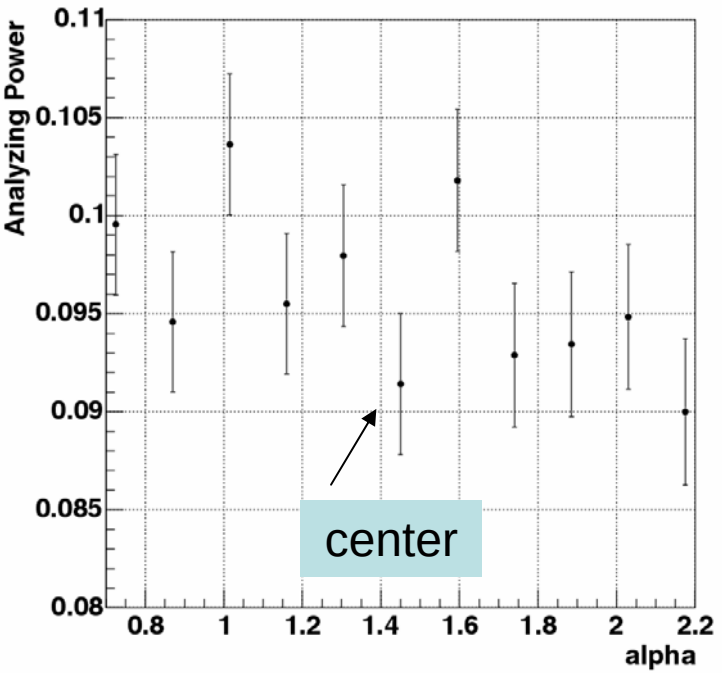
If so, how can be measured? Ellipse from Si?

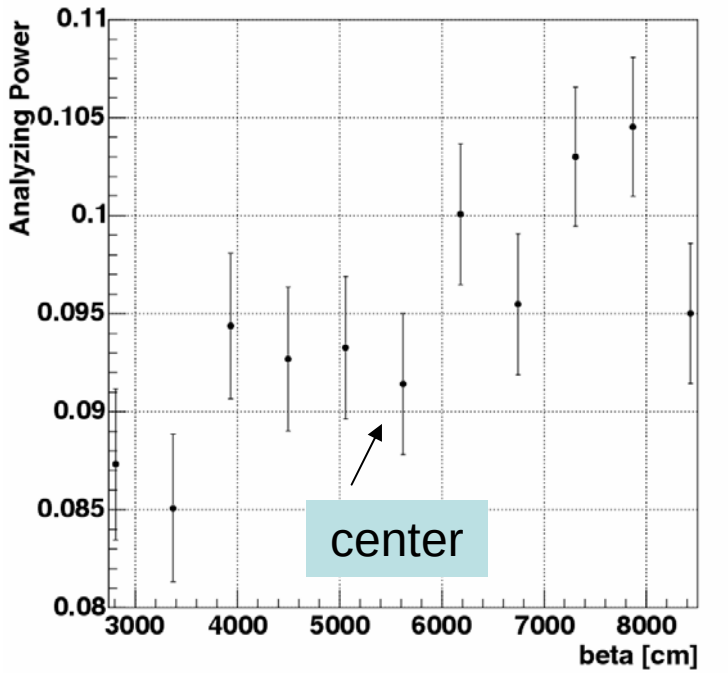
AP .vs. alpha, beta (BEAY)

can be reproduced the focus dependence from Geant3?

At the moment, changed the alpha and beta instead of beam divergence

beam divergence : $\gamma = \frac{1+\alpha^2}{\beta}$





Appear AP depend on beta.

Summary and Future Plan

Summary

✓Slope from Fiber-SiX and alpha from ellipse are generally consistent.

✓TPOL polarisation measurement is sensitive to the tilt between CAL and beam.

Future Plan

✓Check the focus dependence from Geant3