Beam Tilt & TFC: Can we see a (MC) beam tilt?

1. Plot $\langle b \rangle$ vs $\phi$ for different $z$ (barrel) slices
2. Fit to standard form

$$\langle b \rangle = r\sin(\phi + \phi_0) + c$$

(here $c$ should be only a cross check.)

No offset or tilt: $r=0$
$\phi_0 = \text{meaningless}$

A beam offset: $r = \text{constant}$
$\phi_0 = \text{angle to beam center from x-axis}$

A beam tilt: $r = r(z) = m_rz + \eta$
$\phi_0 = \text{angle to beam center from x-axis}$
ZH-$\nu\nu$bb

no beam tilt

6 for barrels

3 summary

no tilt, expect
$r = 0$
$\phi = \text{random}$
Tilt sample
(Lorenzo)
$x, y = 0.5 \, \mu m/cm$

so expect
$m_r = 0.7 \, \mu m/cm$

$\phi = 2.35 \, rad(\?)$

c = 0.0
Tilt sample, again

after applying online correction

expect

\[ m_r = 0 \mu \text{m/cm} \]

\[ \phi = \text{random} \]

find,

m range reduced but clearly not 0

(fit is nuts???)

b looks much better!

10/18/02, updated
Looks encouraging

- see correct tilt using STT trigsim tracks

- after applying correction, see significantly better impact parameter distribution, but still a slope in radius. Overcorrecting? (Have checked z of vertex vs. barrel)

- concern: the no-tilt sample gives poor $\chi^2$ values for both fits. Why? Don’t know, but
  - $\rightarrow$ p10 SMT MC problem, fixed in p11
  - $\rightarrow$ bug in my code...

- work continues...