

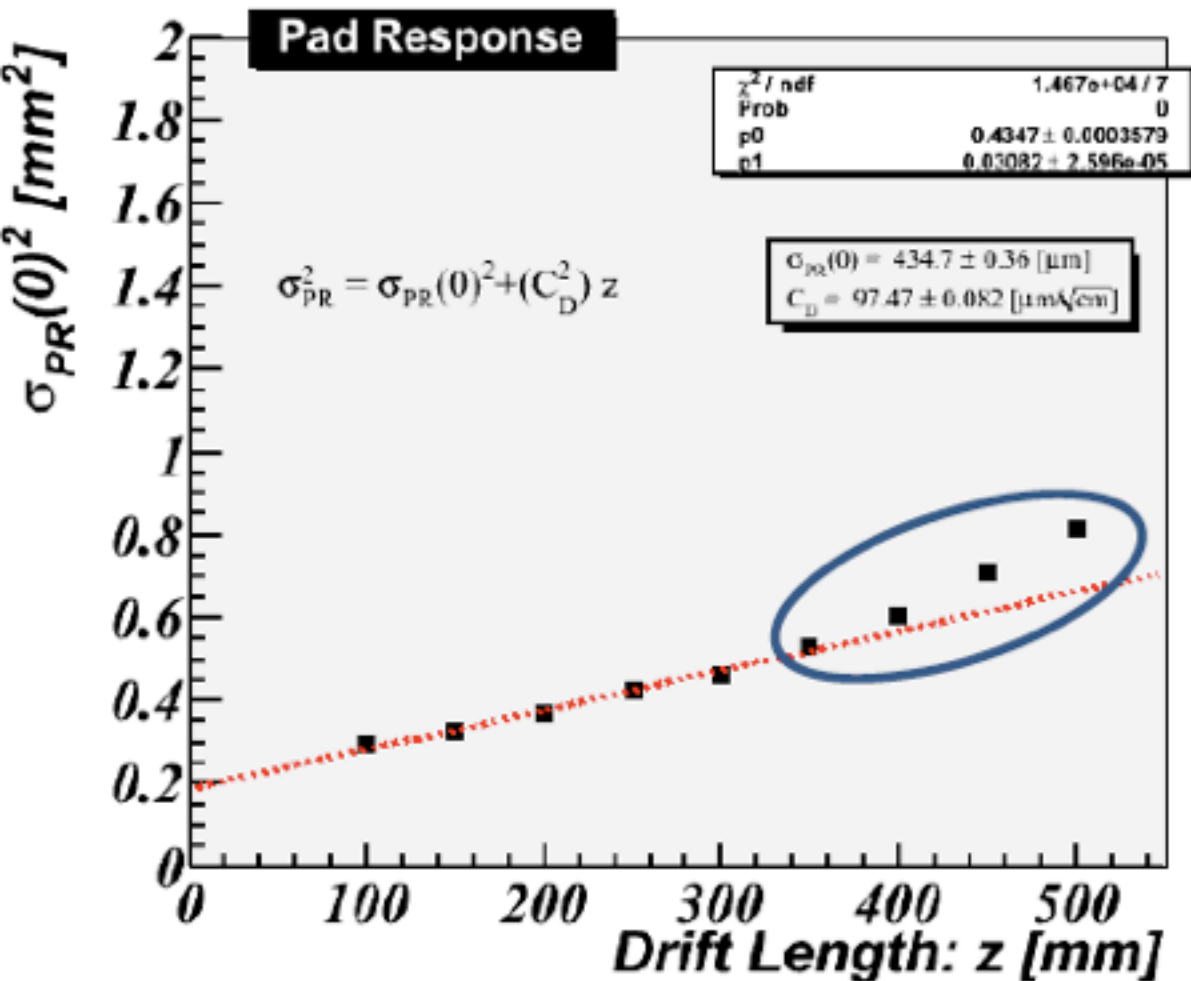
Pad response and distortion

studied by H. Yamaguchi

What is motivation

Pad response

P=5[GeV], B=1[T], Layer21



Simulation with Magboltz.

When B=1T

$$C_D = 95.29 \text{ [}\mu\text{m}/\sqrt{\text{cm}} \text{]}$$



$$C_D = 97.47 \text{ [}\mu\text{m}/\sqrt{\text{cm}} \text{]}$$

Red line reasonably agree with Garfield.
should be OK.

We observe some effect on PadResponse
at long drift

discrepancy ~ 300~400um@50cm

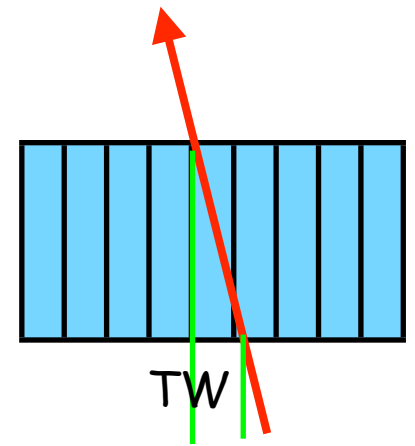
What this ?
and
Why this ?

What make PR wide

track angle to pad direction

angled track will widen PR $PR^2 = \sigma_0^2 + D^2z + TW^2$

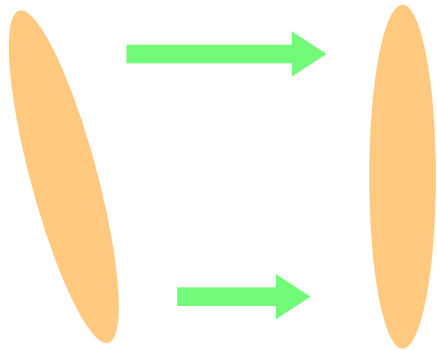
effect will be removed after angle cut



distortion from ExB

effect would be removed also

if distortion is simple mapping

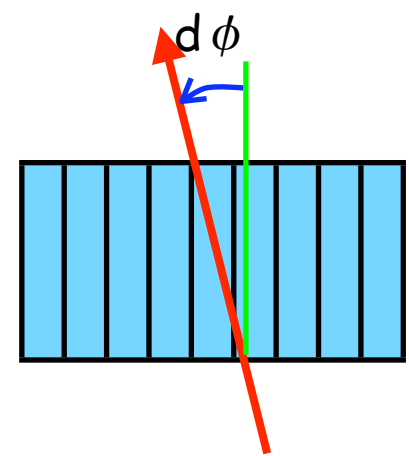


If we select "straight track" to pad
PR must be same

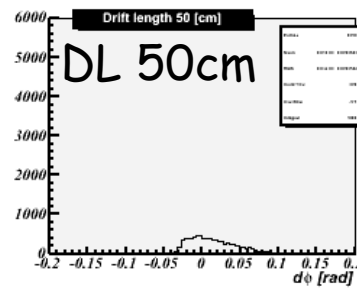
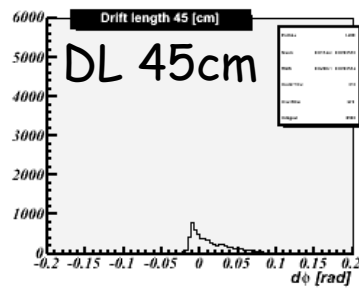
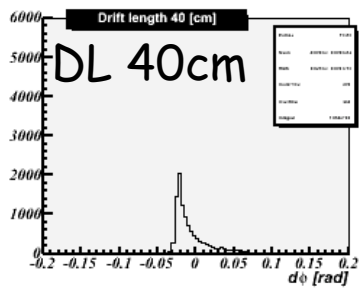
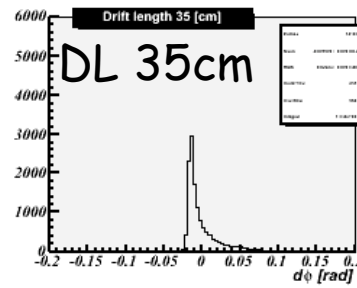
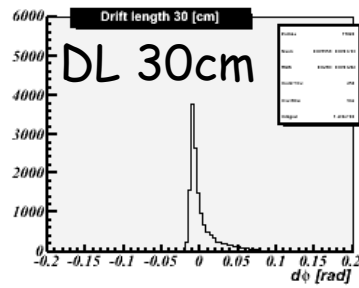
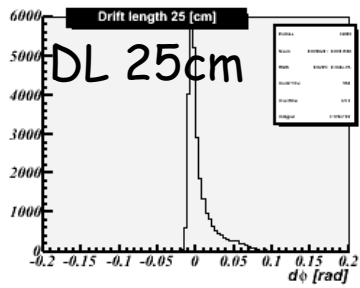
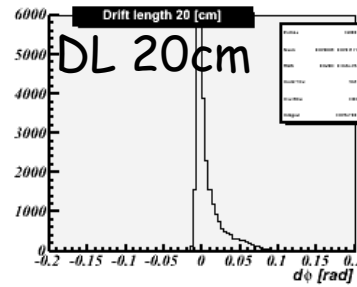
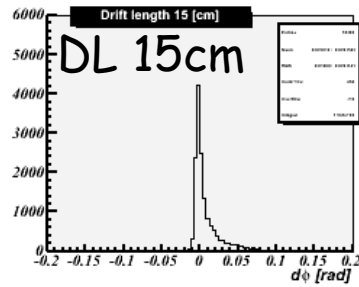
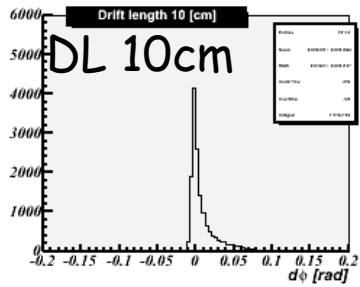
ExB effect in gas amplification region

we need to choose "GOOD" track anyway

Angular distribution of track to pad direction



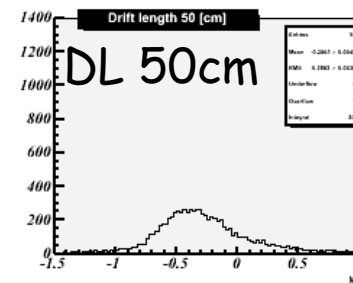
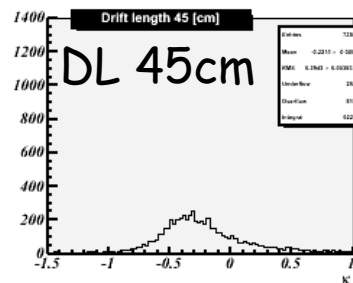
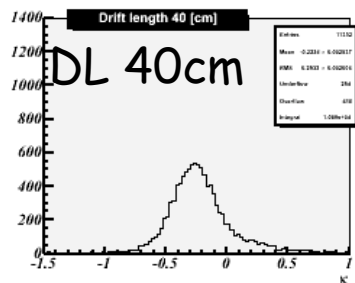
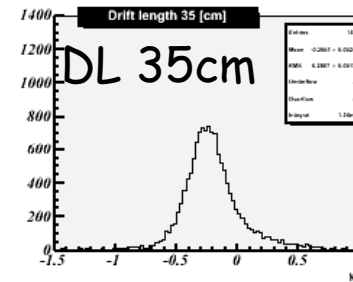
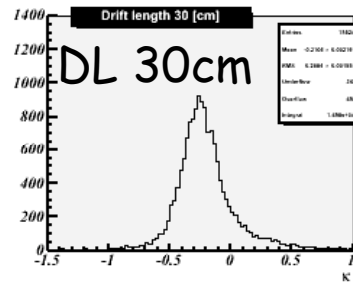
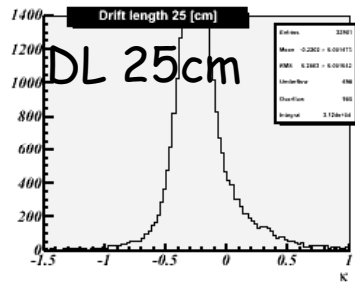
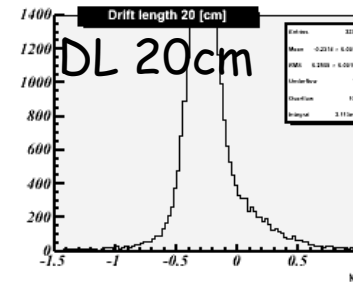
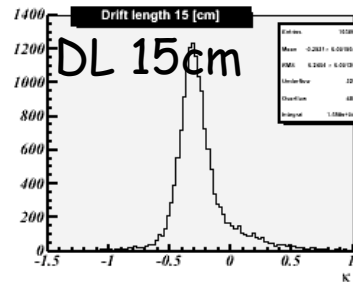
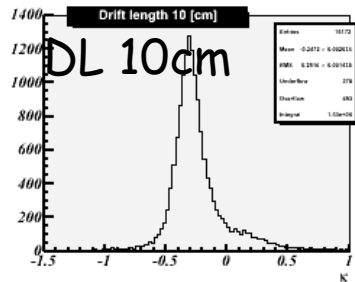
pad row #19



We observe many "not straight" tracks at long drift

Other track parameters

K distribution

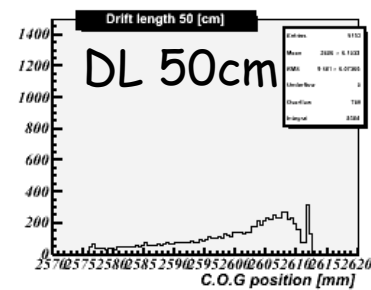
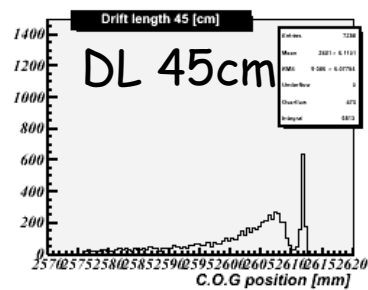
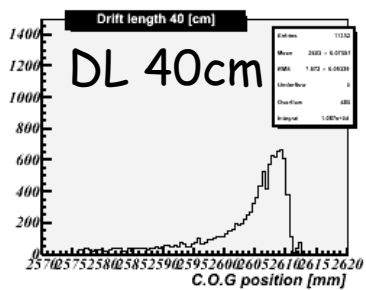
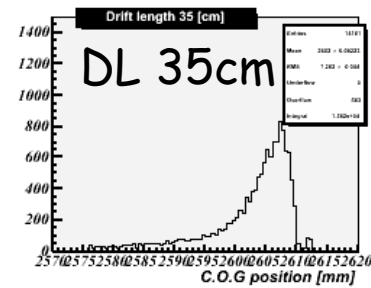
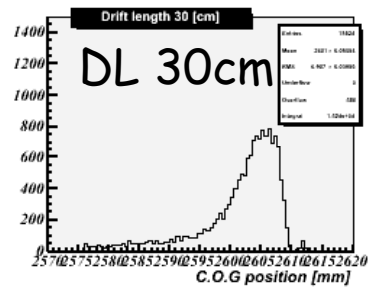
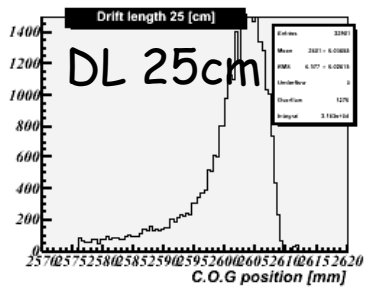
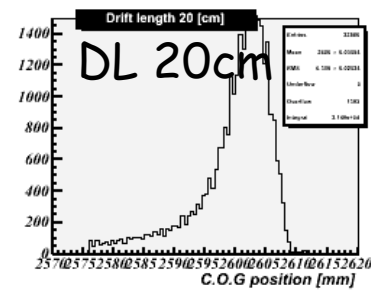
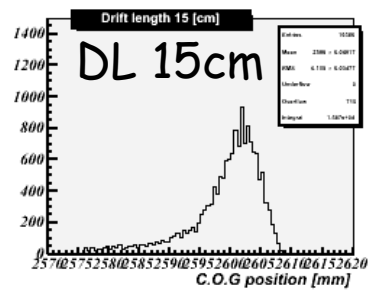
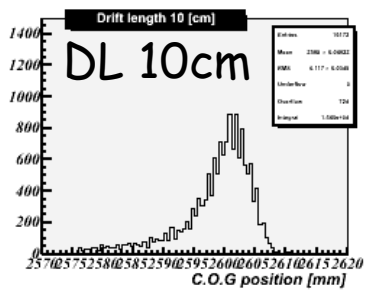


$$p_t = 5 [Gev]$$

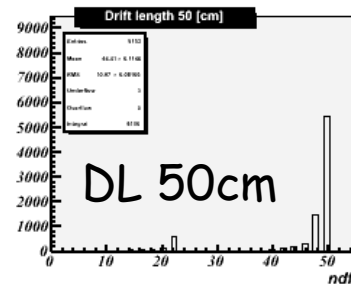
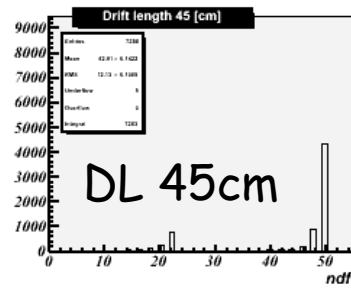
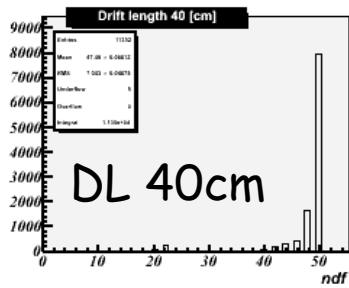
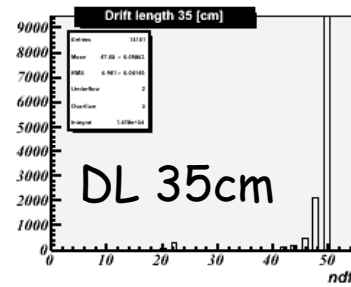
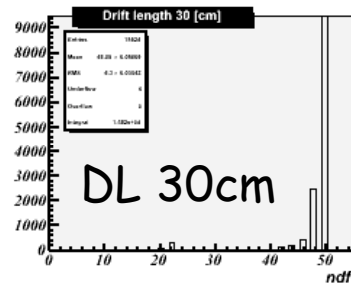
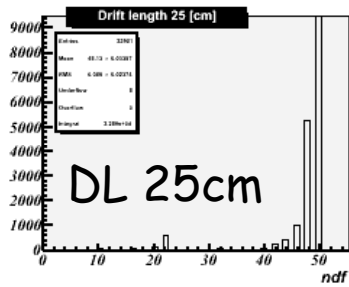
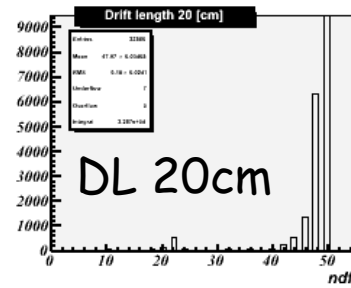
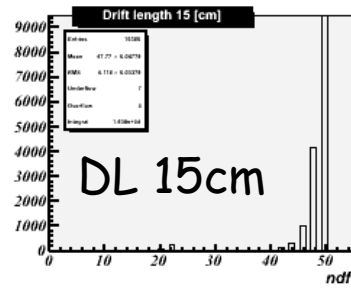
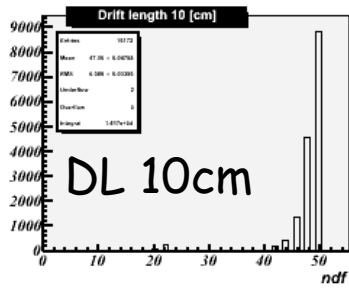
$$B = 1 [T]$$

$$K = -\frac{1}{p_t} = -0.2$$

C.O.G position distribution

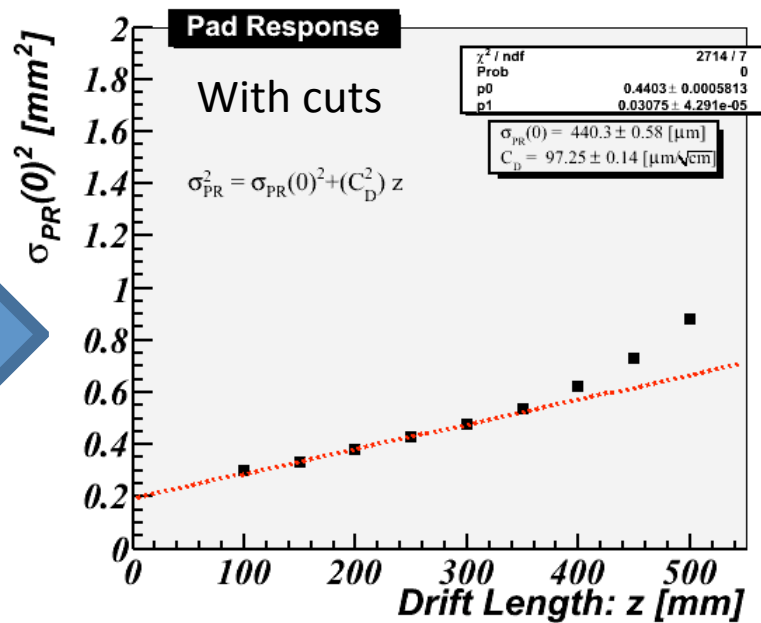
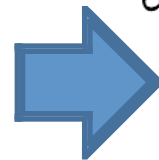
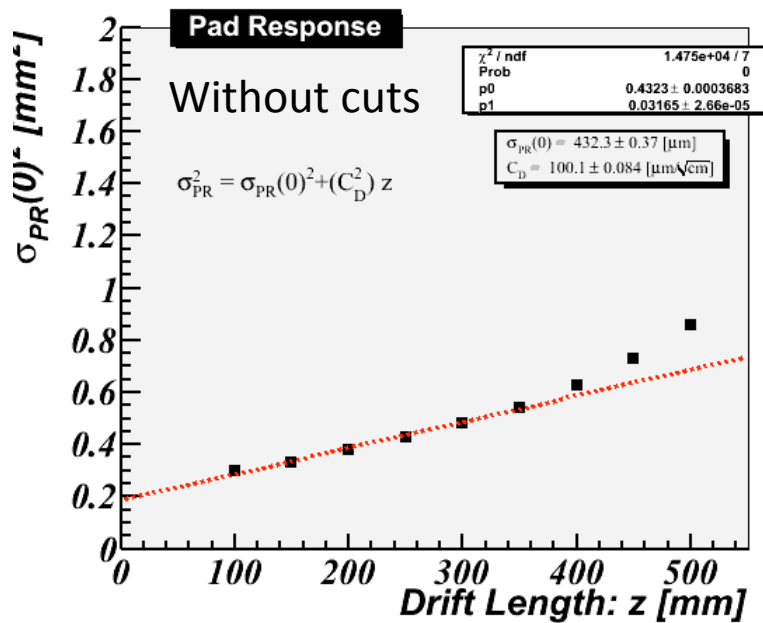


Ndf distribution



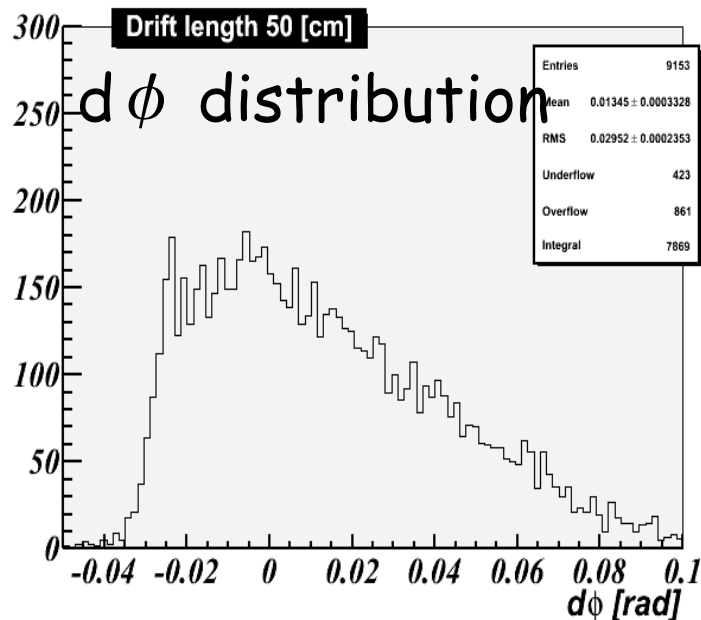
track selection

- 1) $-0.02 < d\phi < 0.02$ TW ~ 100um @0.02
- 2) $-0.4 < \kappa < 0.0$
- 3) Ndf = 50
- 4) COG 5 pads away from edge



Nothing changed !!

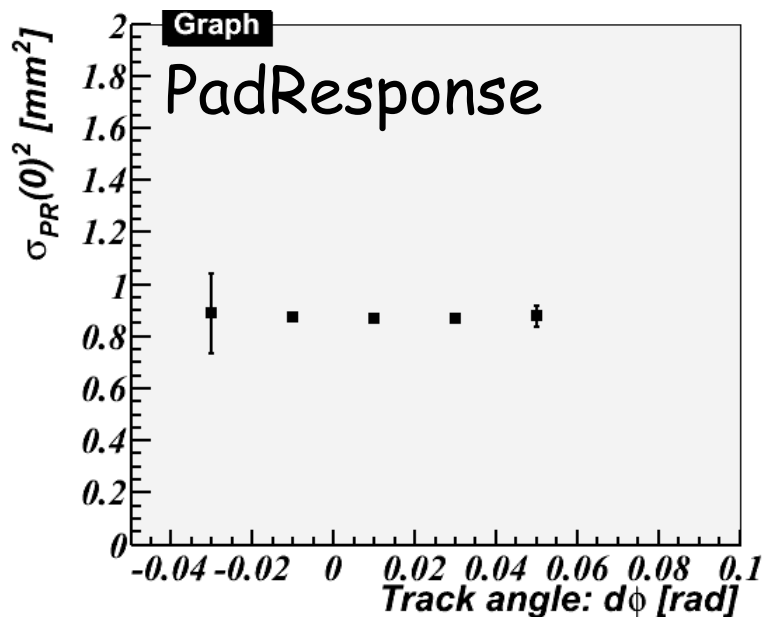
PR as a function of $d\phi$ at drift distance 50cm



PadResponse must be changed as $d\phi$

We did not observe clear dependence

Why ??



Summary

Hiroshi is trying to figure out

Why PadResponse become larger than expected
at long drift.

It might be due to non-uniform B field

But we cannot get clear conclusion yet.