

# PQB during HAPPEX-III

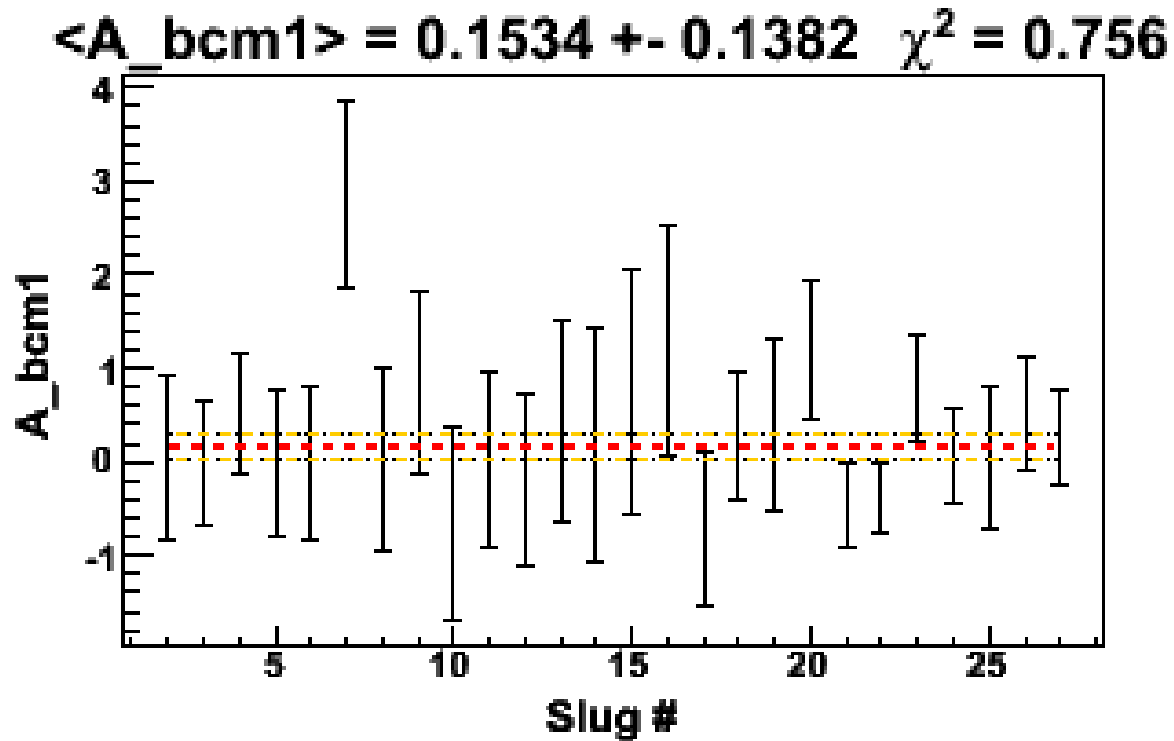
B-Team Meeting  
October 28, 2009

# PQB Requirements

Experiment	Hall	Start	Energy (GeV)	Current ( $\mu\text{A}$ )	Target	$A_{\text{pv}}$ (ppm)	Maximum Charge Asym (ppm)	Maximum Position Diff (nm)
HAPPEX-III	A	Aug 09	3.484	100	$^1\text{H}$ (25 cm)	$16.9 \pm 0.4$	$1 \pm 1$	$10 \pm 10$
PVDIS	A	Oct 09	6.068	100	$^2\text{H}$ (25 cm)	$63 \pm 3$	$1 \pm 1$	$10 \pm 10$
PREx	A	March 10	1.056	100	$^{208}\text{Pb}$ (0.5 mm)	$0.500 \pm 0.015$	$0.100 \pm 0.010$	$2 \pm 1$
QWeak	C	May 10	1.162	180	$^1\text{H}$ (35 cm)	$0.234 \pm 0.005$	$0.100 \pm 0.010$	$2 \pm 1$
Achieved							$0.4 \pm 0.1$	$1 \pm 1$

# Achieved during HAPPEX-III

Charge Asymmetry:

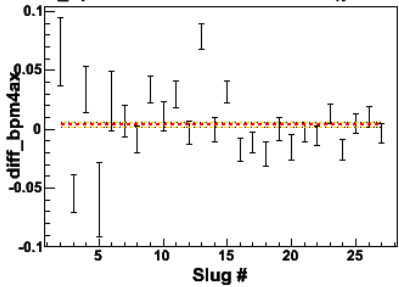


units:  $\mu\text{m}$  for position (x & y) and  $\mu\text{radian}$  for angle (slope)

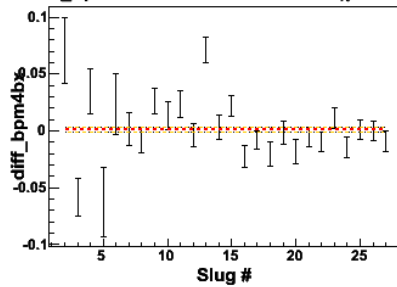
## BPM Slug Differences

----- Sign Corrected Global Avg

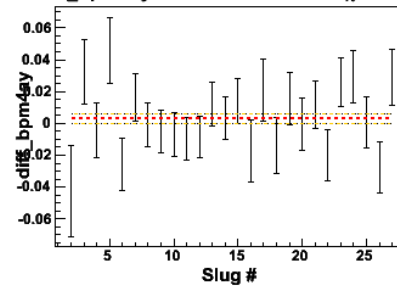
$\langle \text{diff\_bpm4ax} \rangle = 0.0035 \pm 0.0021 \quad \chi^2 = 5.012$



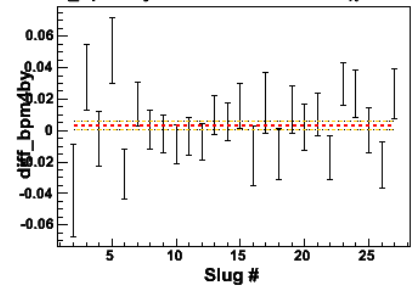
$\langle \text{diff\_bpm4bx} \rangle = 0.0006 \pm 0.0021 \quad \chi^2 = 4.163$



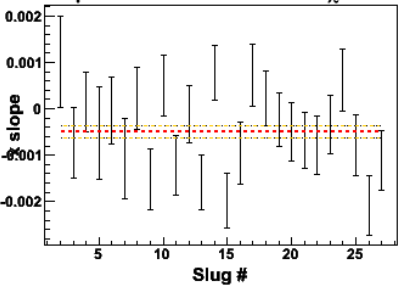
$\langle \text{diff\_bpm4ay} \rangle = 0.0026 \pm 0.0031 \quad \chi^2 = 1.322$



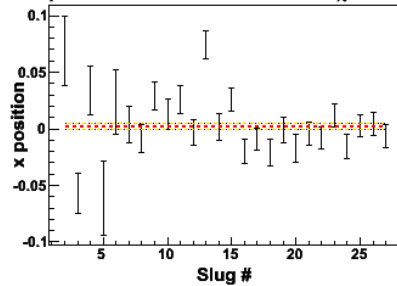
$\langle \text{diff\_bpm4by} \rangle = 0.0032 \pm 0.0029 \quad \chi^2 = 1.352$



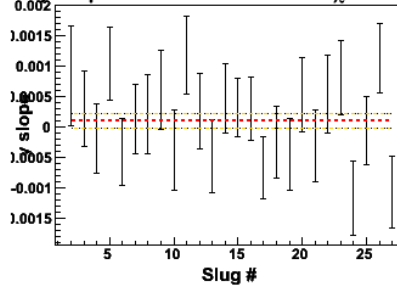
$\langle \text{x slope} \rangle = -0.0005 \pm 0.0001 \quad \chi^2 = 1.679$



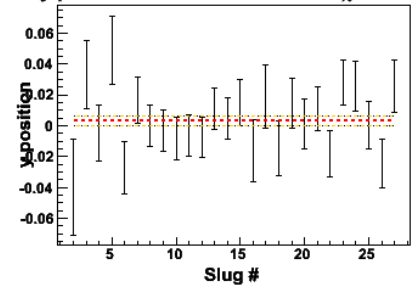
$\langle \text{x position} \rangle = 0.0020 \pm 0.0024 \quad \chi^2 = 3.578$



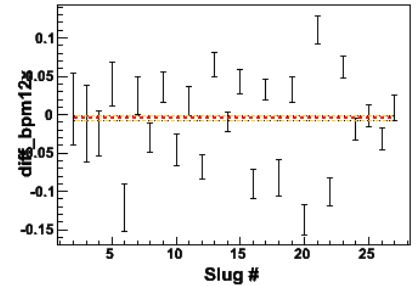
$\langle \text{y slope} \rangle = 0.0001 \pm 0.0001 \quad \chi^2 = 1.139$



$\langle \text{y position} \rangle = 0.0030 \pm 0.0031 \quad \chi^2 = 1.209$



$\langle \text{diff\_bpm12x} \rangle = -0.0049 \pm 0.0035 \quad \chi^2 = 10.349$



# Accelerator Issues: Summary

- I. PQB achieved and good for PVDIS. No need for PQB work in Injector for PVDIS. More work is needed for PREx.
- II. Compton Background
- III. Phase Advance
- IV. BPM Saturation and FFB
- V. Injector Drift