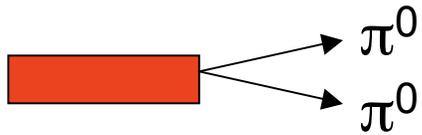


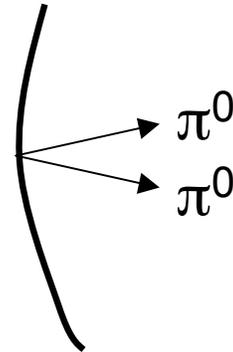
Csl Energy Scale Checks
with Hadronic $2\pi^0$
and $K_L \rightarrow 3\pi^0$

R. Kessler
KTeV Collab Meeting
Nov 19, 2005

Hadronic $2\pi^0$



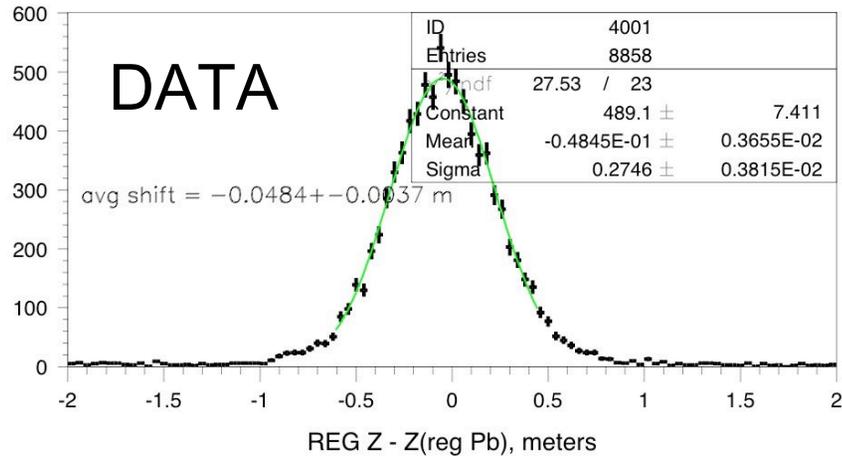
Nearly delta-function
Z-distribution
from regenerator



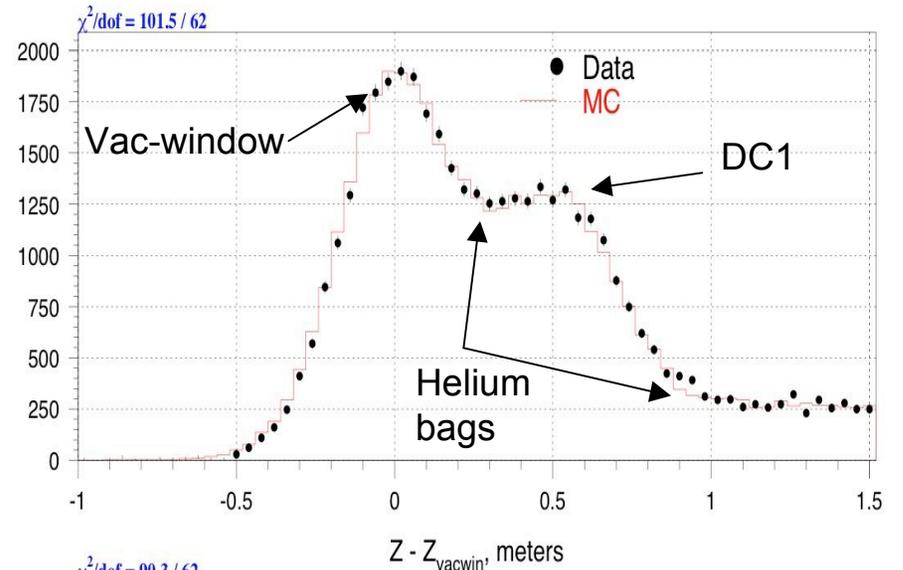
delta-function from
vacuum window +
continuum from helium
bags and DC1

1999 DATA VS. MC

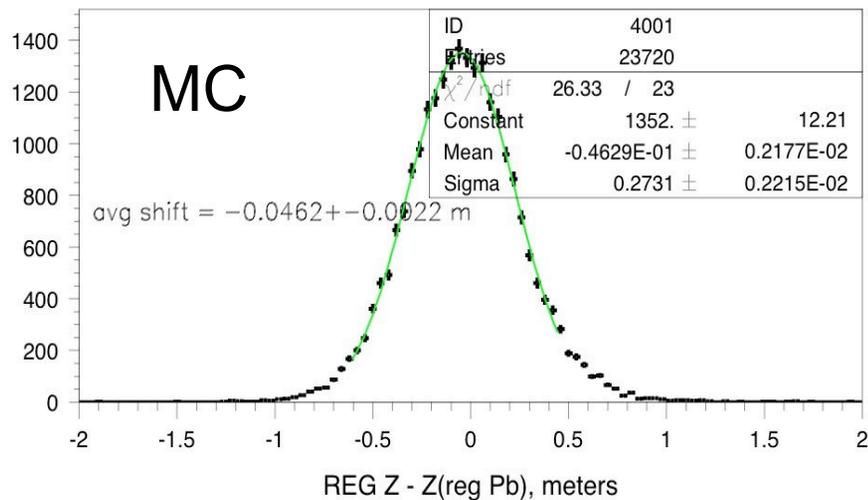
Hadronic $2\pi^0$ Z shift at ZREGD (DATA)



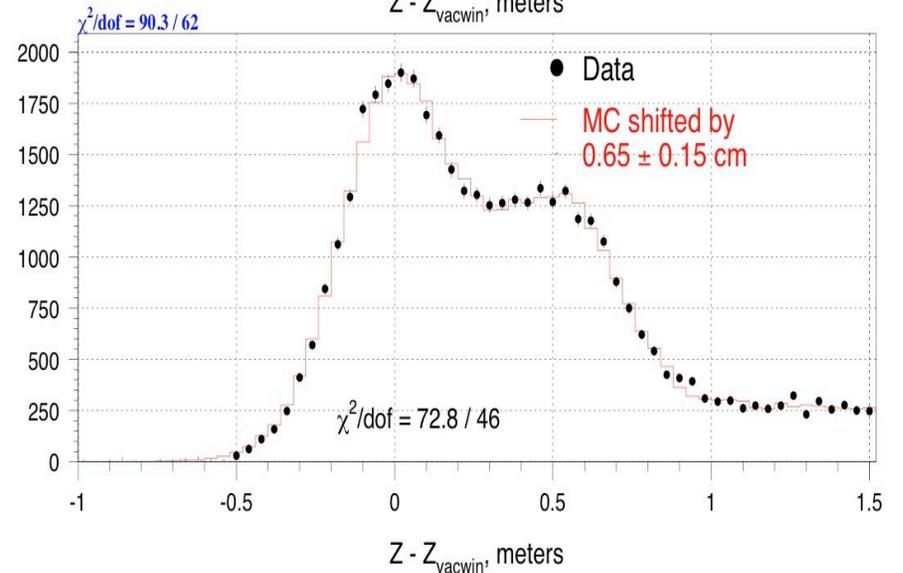
Data/MC at Vacuum Window



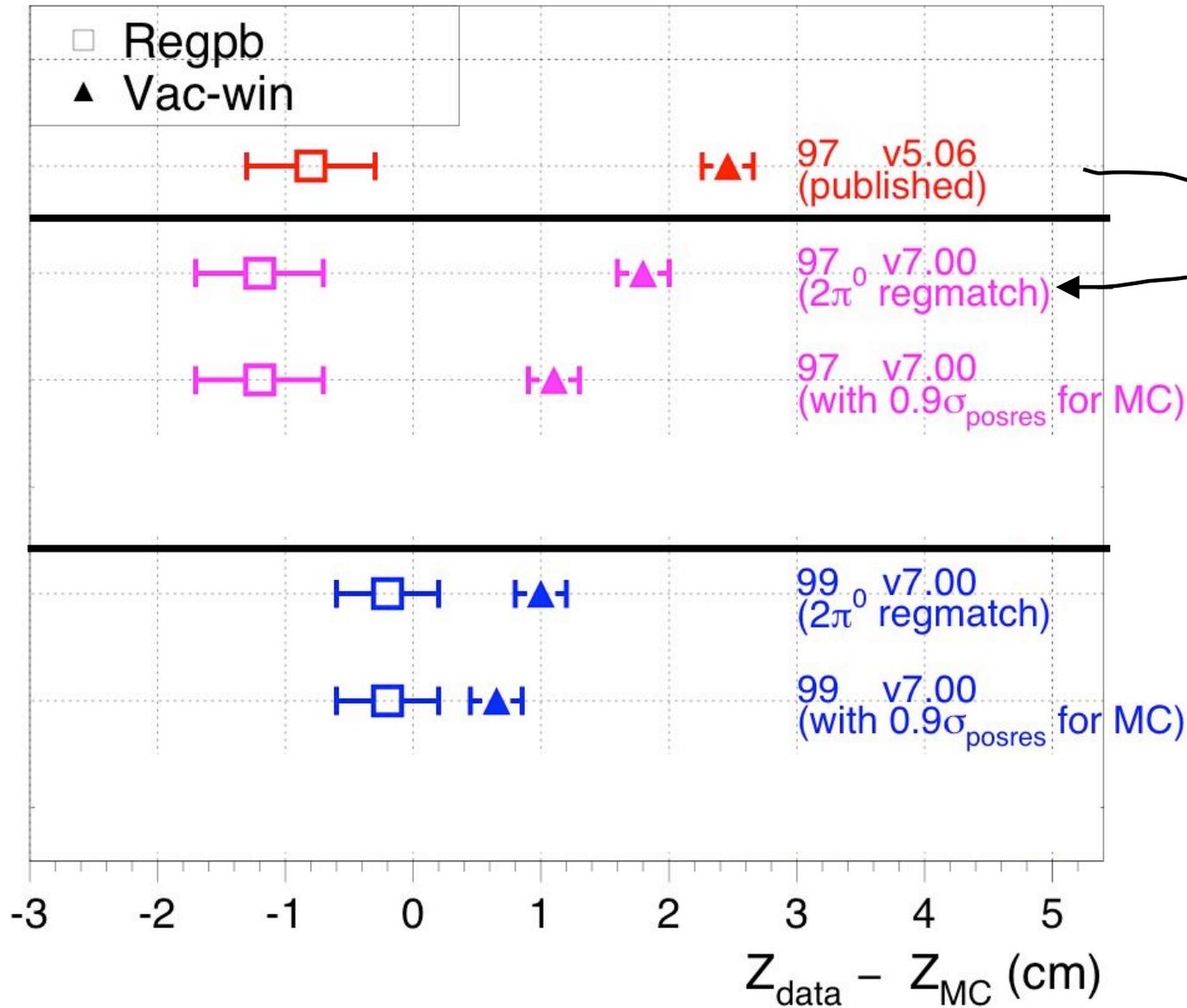
Hadronic $2\pi^0$ Z shift at ZREGD (MC)



Z - Z_{vacwin}, meters



Results



Improvement
mainly from better
treatment of material
downstream of
vacuum window.

Data-MC Comparisons

Sample	$Z_{\text{reg}}(\text{data})$ - $Z_{\text{reg}}(\text{MC})$	$Z_{\text{vw}}(\text{data})$ - $Z_{\text{vw}}(\text{MC})$	Z-stretch
1997	-1.2(5)	+1.8(2) cm	3.0(5) cm
1999	-0.2(4)	+1.0(2)	1.2(4)
1997	-1.2(5)	+1.1(2)	2.3(5)
1999	-0.2(4)	+0.7(2)	0.9(4)
1997	-0.8(4)	+2.5(2)	+3.3(5)

v7.00 with
 $K_L \rightarrow 2\pi^0$
regmatch

v7.00 with
 $0.9\sigma_{\text{posres}}$

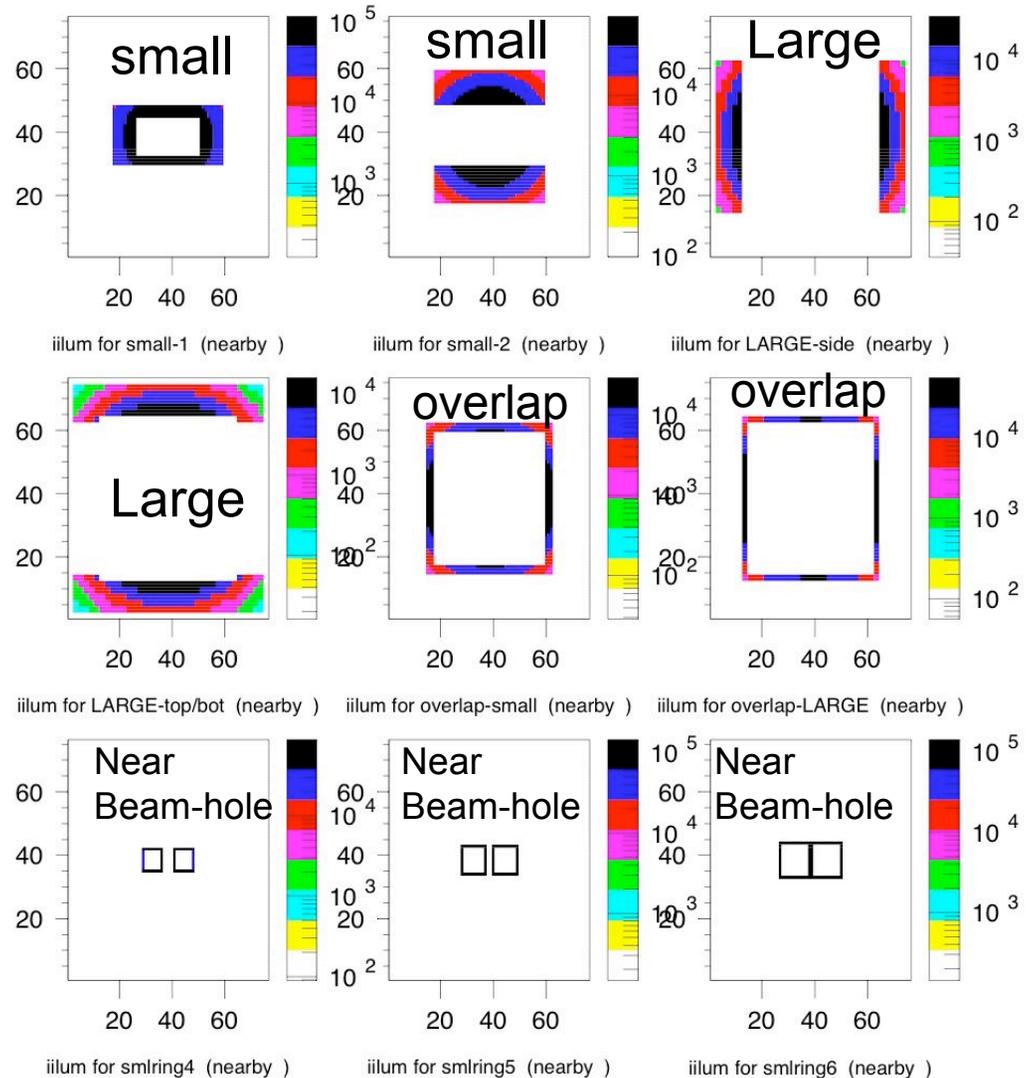
v5.06
(published)

Better treatment of
Material at vac-window

Another Crosscheck with

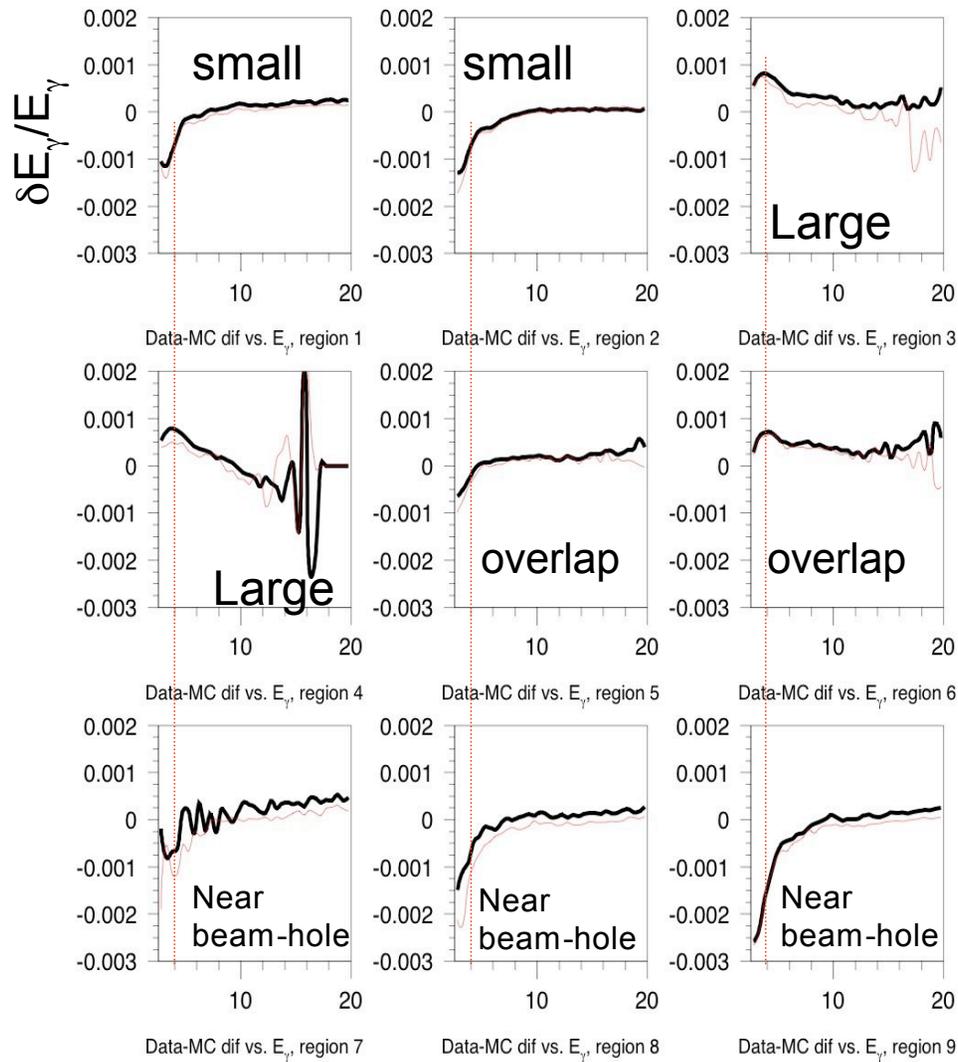
$$K_L \rightarrow 3\pi^0$$

Fit each event for
 6 photon energies:
 4 kinematic
 constraints
 \Rightarrow 2 dof.
 (for 9 regions
 shown at right)



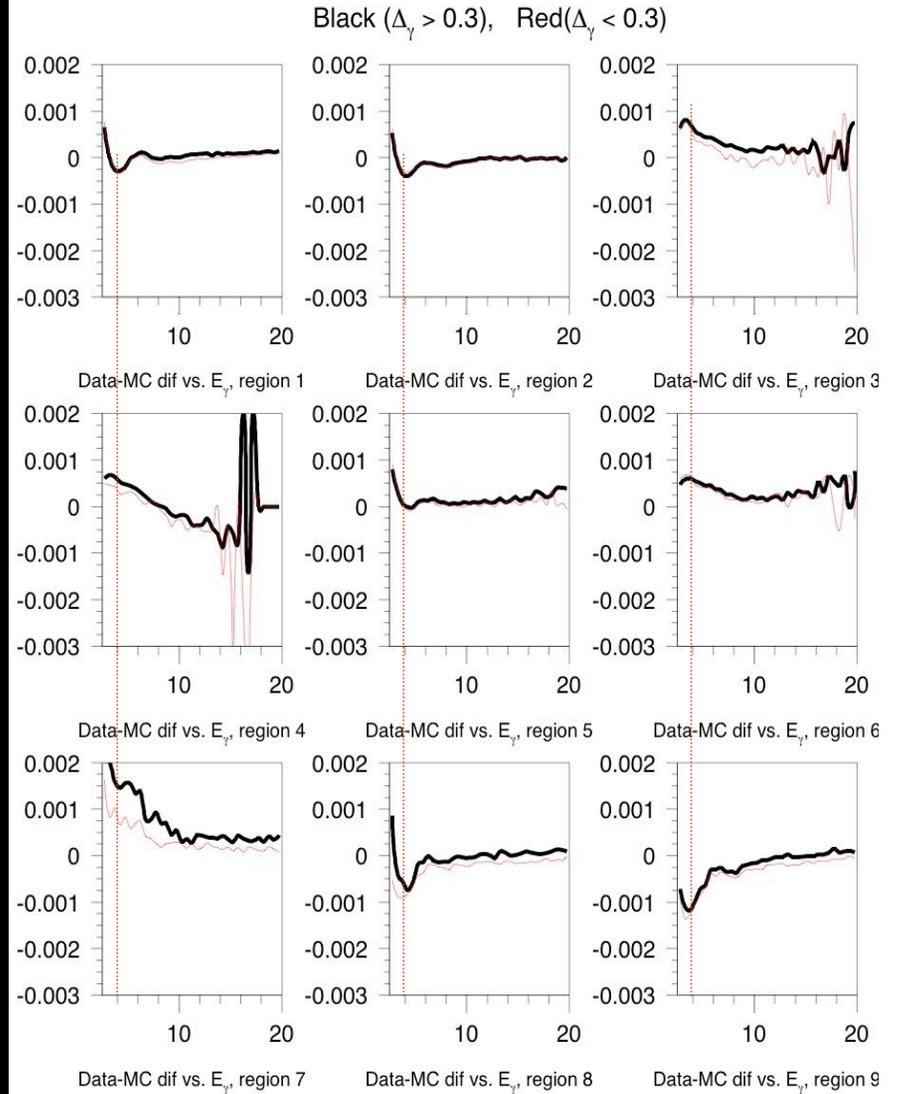
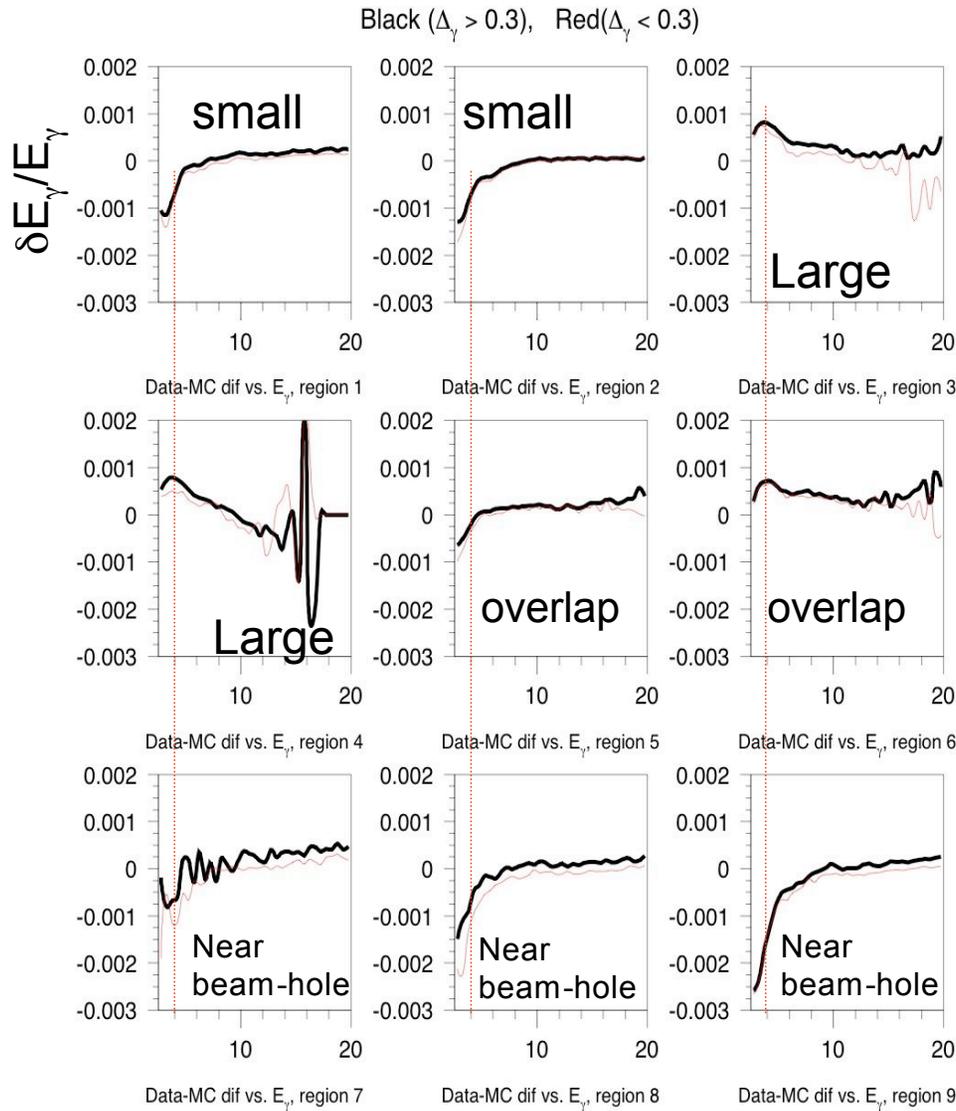
97 DATA-MC DIFFERENCE

Black ($\Delta_\gamma > 0.3$), Red ($\Delta_\gamma < 0.3$)



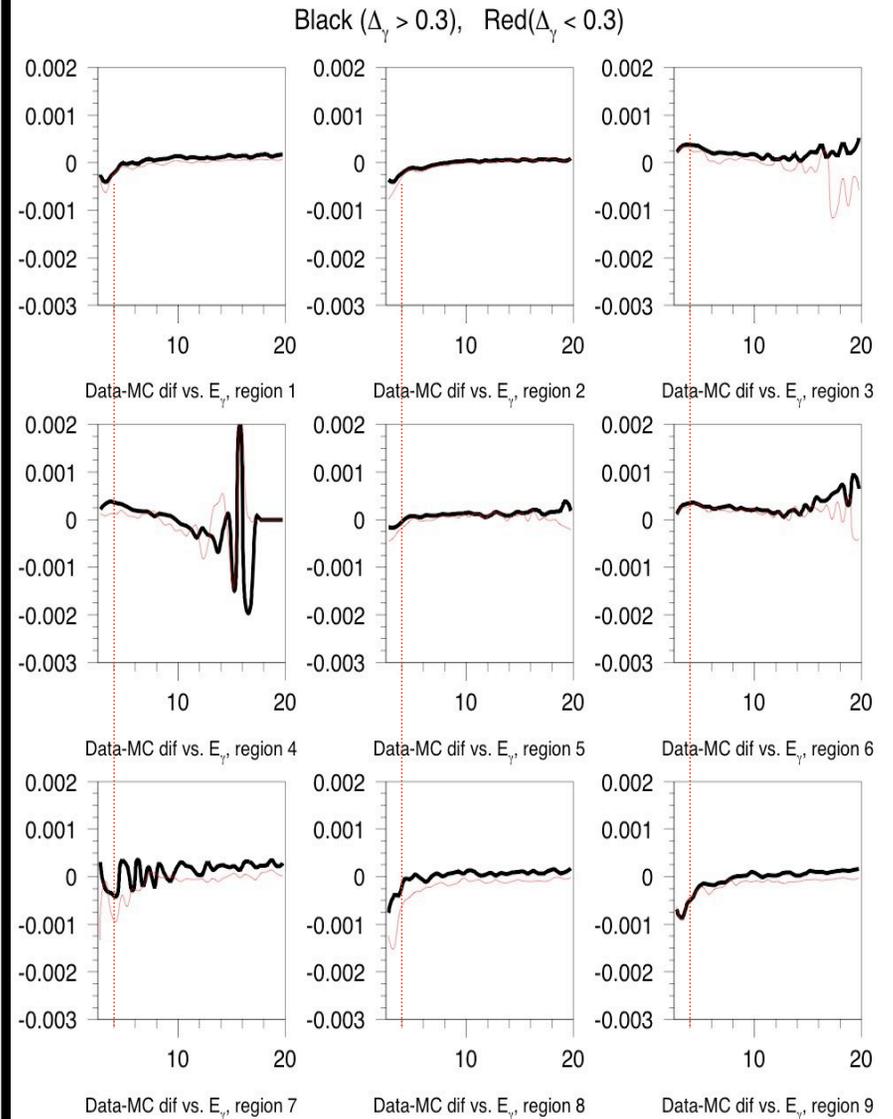
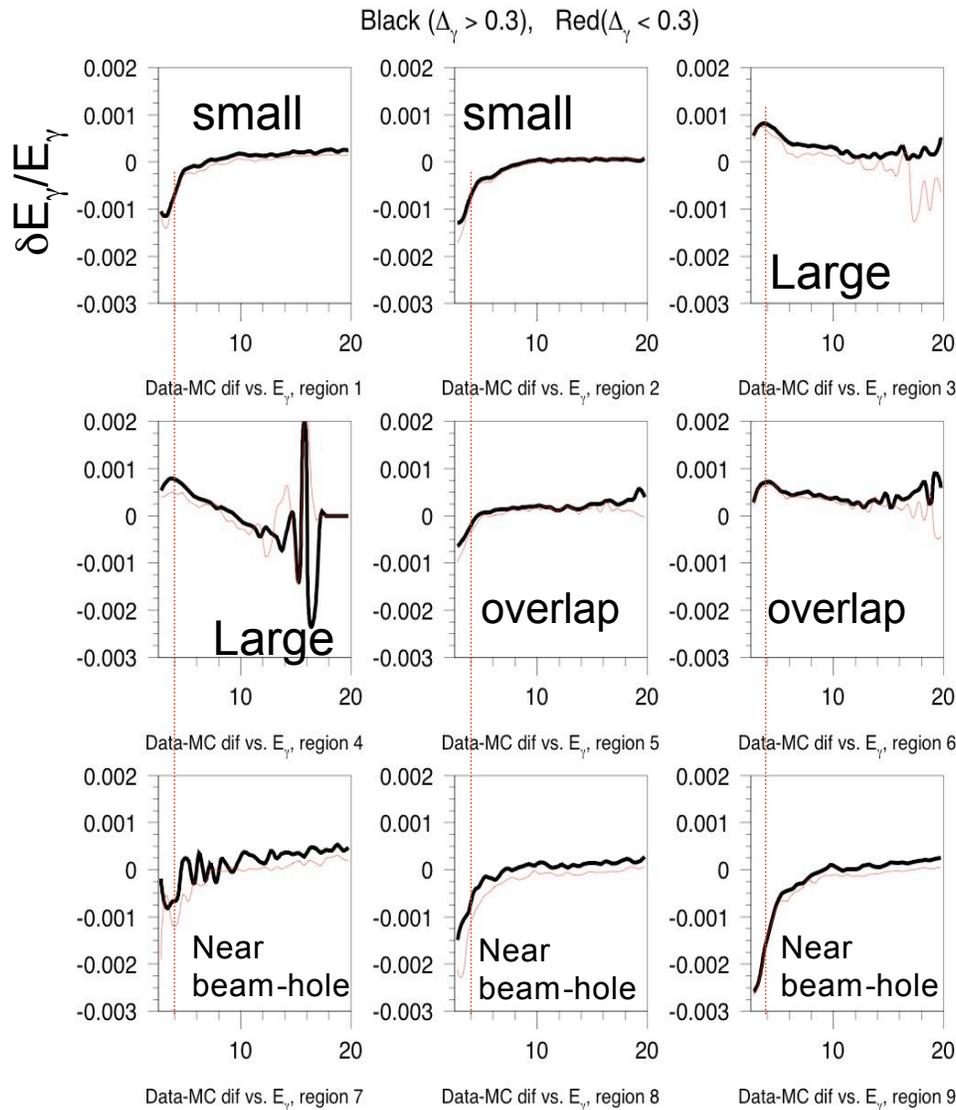
97 DATA-MC DIFFERENCE

99 DATA-MC DIFFERENCE

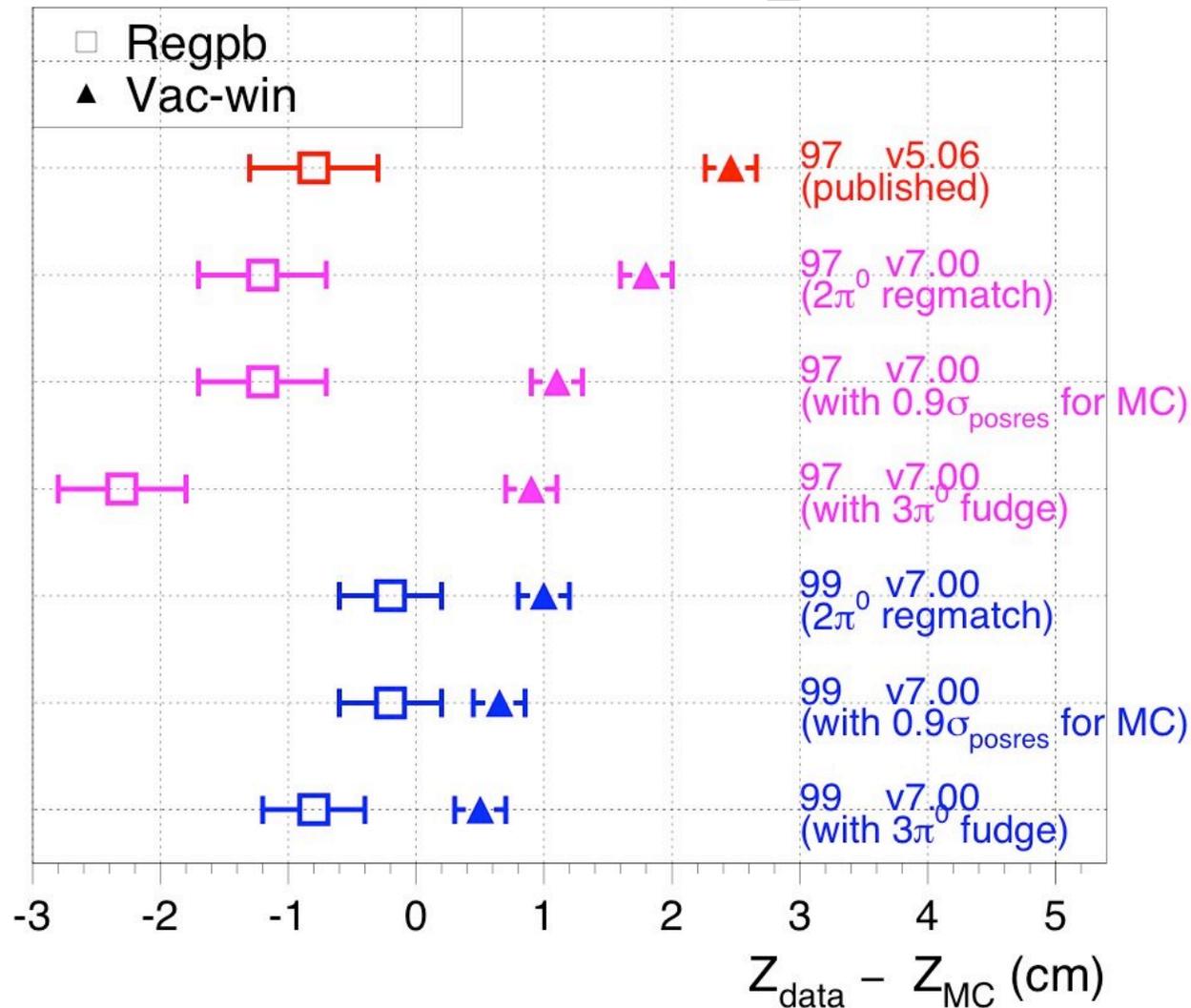


97 DATA-MC DIFFERENCE

97 DATA-MC DIFFERENCE WITH SELF-CORRECTION



Hadronic $2\pi^0$ Results with Correction from $K_L \rightarrow 3\pi^0$



- E-scale correction from $K_L \rightarrow 3\pi^0$ does not help hadronic $2\pi^0$.
- These corrections will at least be used for systematic studies.