



# Measuring Beam Size with Sextupoles

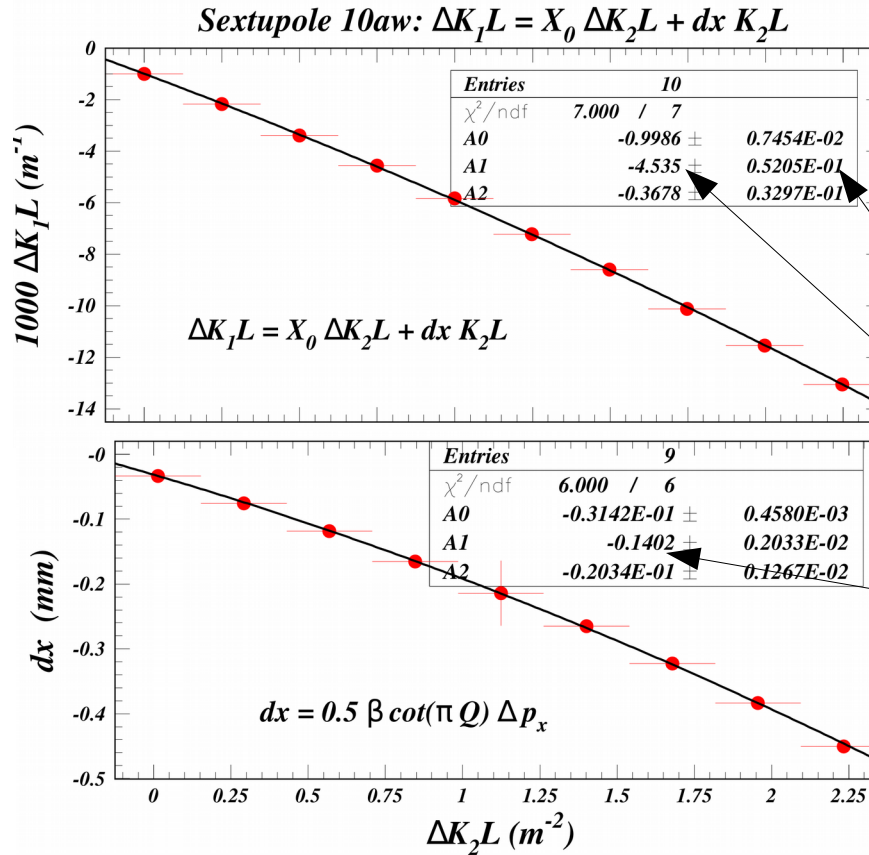
- Initial results from machine studies 19-22 February-

Quad kick  $\Delta K_1 L$   
from tune change

The tune is decreasing, so we know the quad kick is decreasing, i.e. the beam is moving closer to the center of the sextupole.

Dipole kick  $\Delta p_x$   
from wave analysis of difference orbit

The beam is moving and “accelerating” toward the center of the sextupole.



Updated 27 March  
with  $\Delta K_1 L$  sign correction  
and improved fits

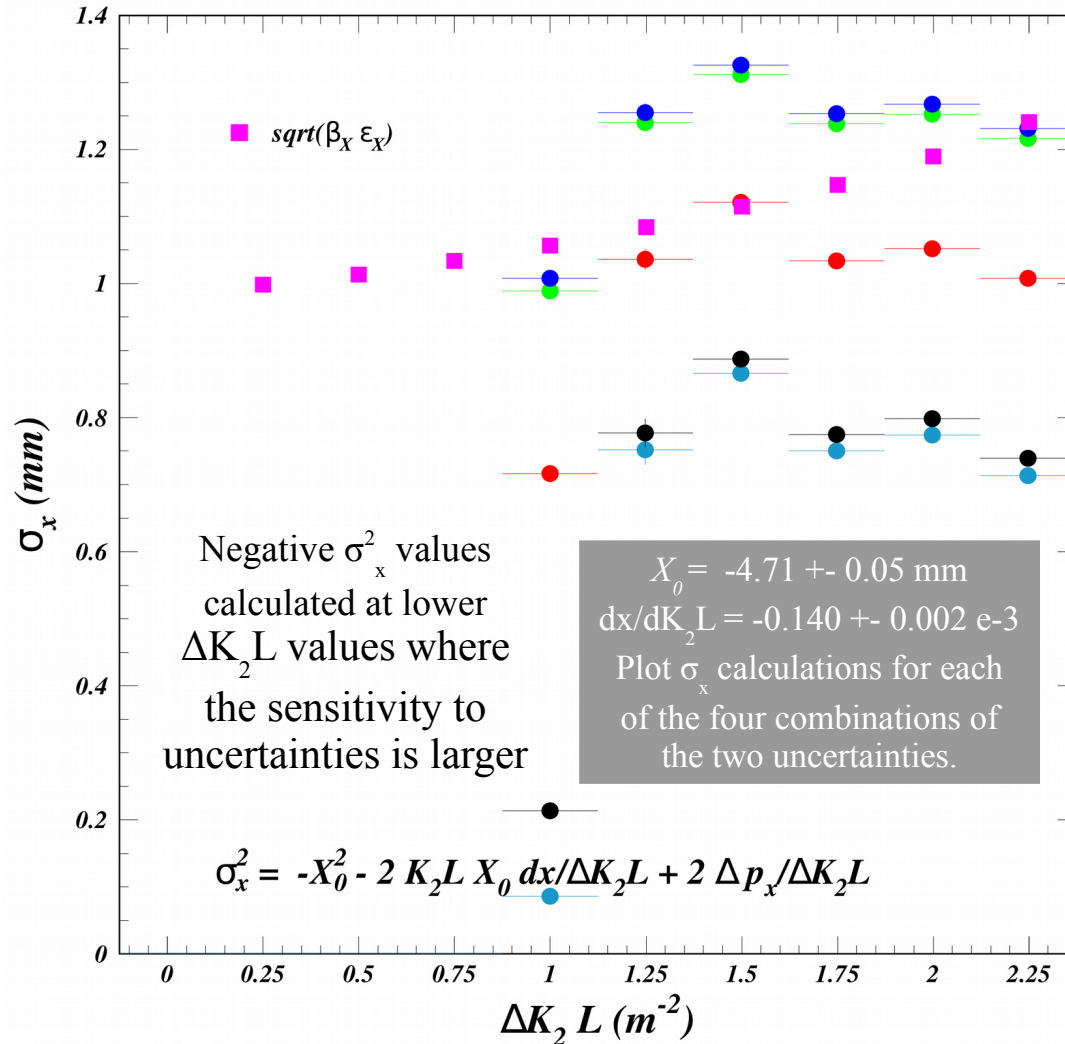
Two contributions to the slope:  $X_0$  and the linear part of  $dx$  multiplied by the original  $K_2 L$

$X_0 = -4.535$   
- (-0.140) (-1.24)

$X_0 = -4.71 \pm 0.05 \text{ mm}$



*Sextupole 10aw:  $\Delta K_1 L = X_0 \Delta K_2 L + dx K_2 L$*



Updated 31 March  
with  $\text{sqrt}(\beta_x \epsilon_x)$