# Impact of Flux Uncertainty on the NovA Numu Disappearance Measurement

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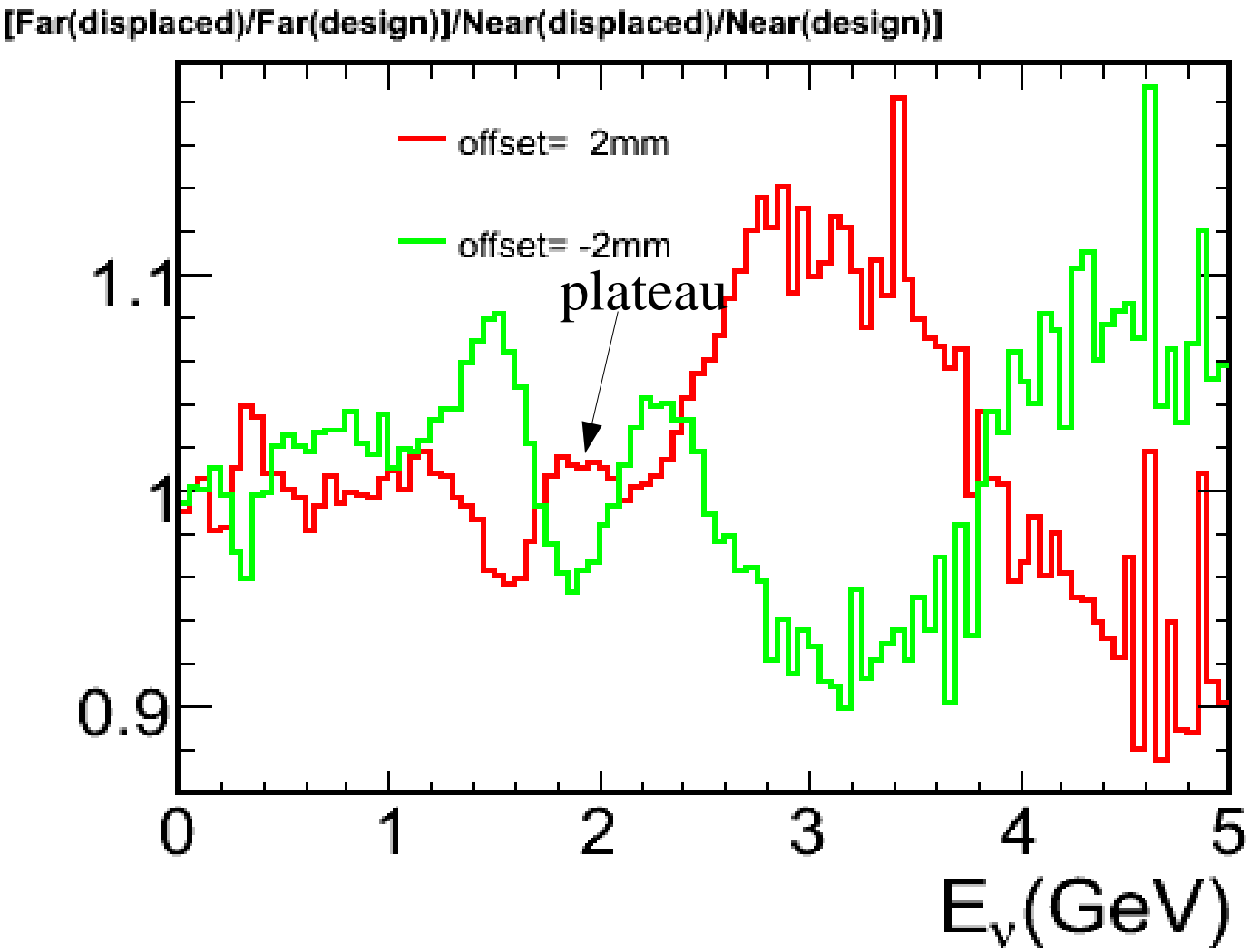
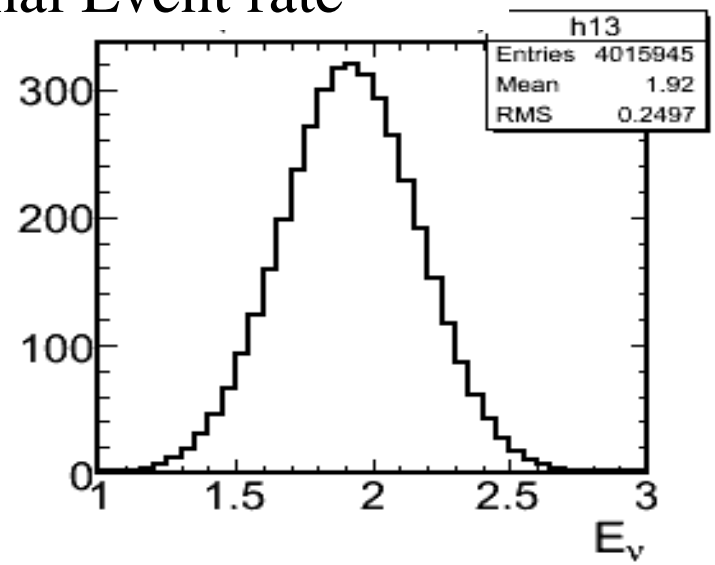
# New Flux Ratios from Wes

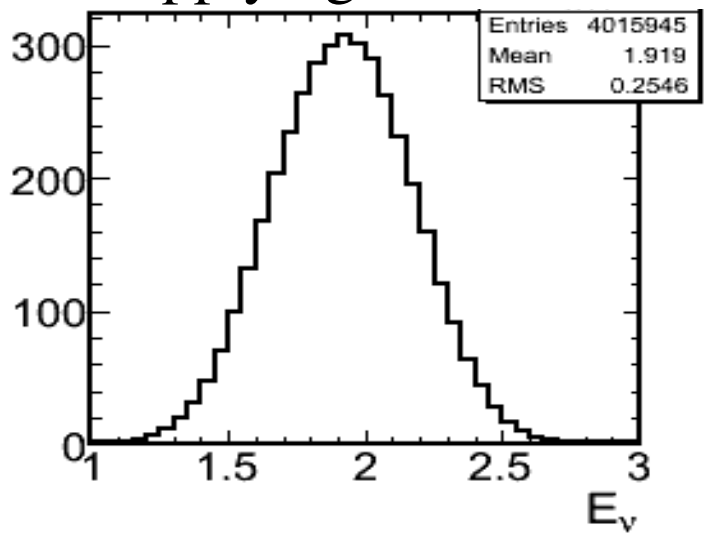


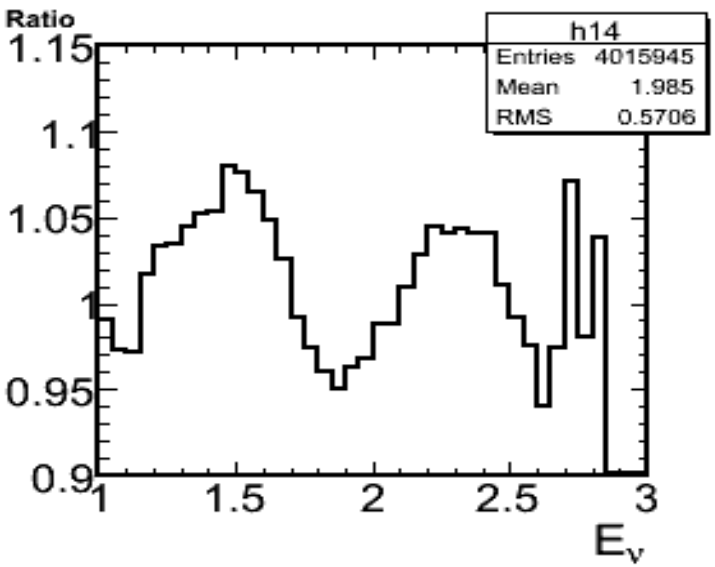
# Numu Event Rate (-2mm)

Original Event rate

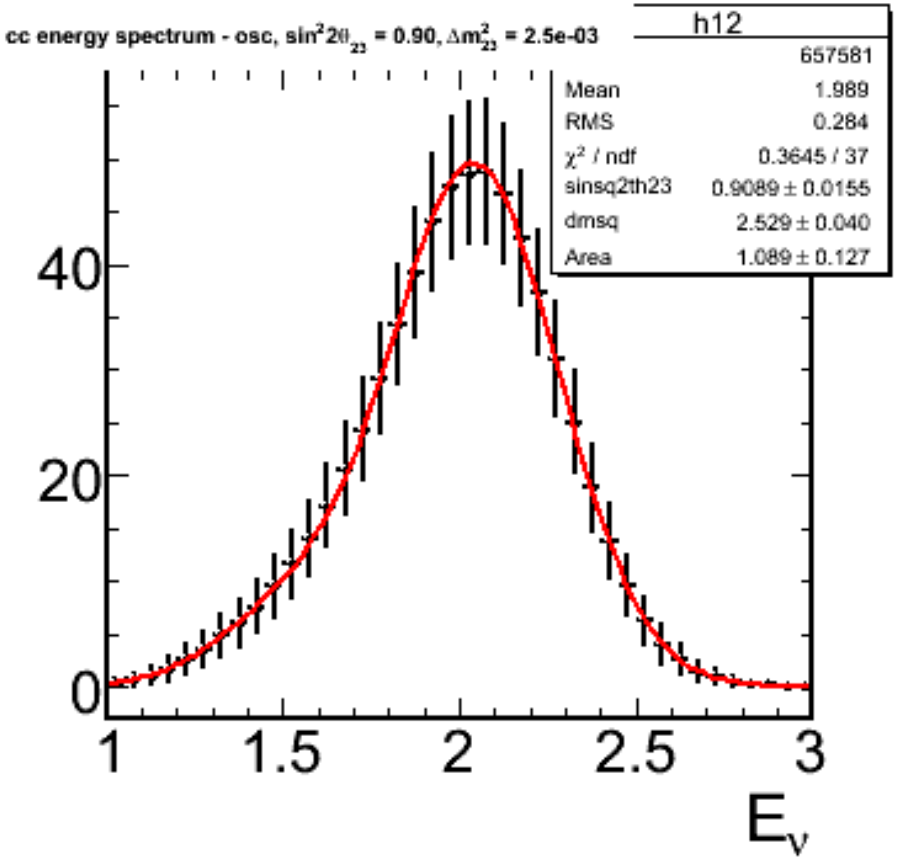


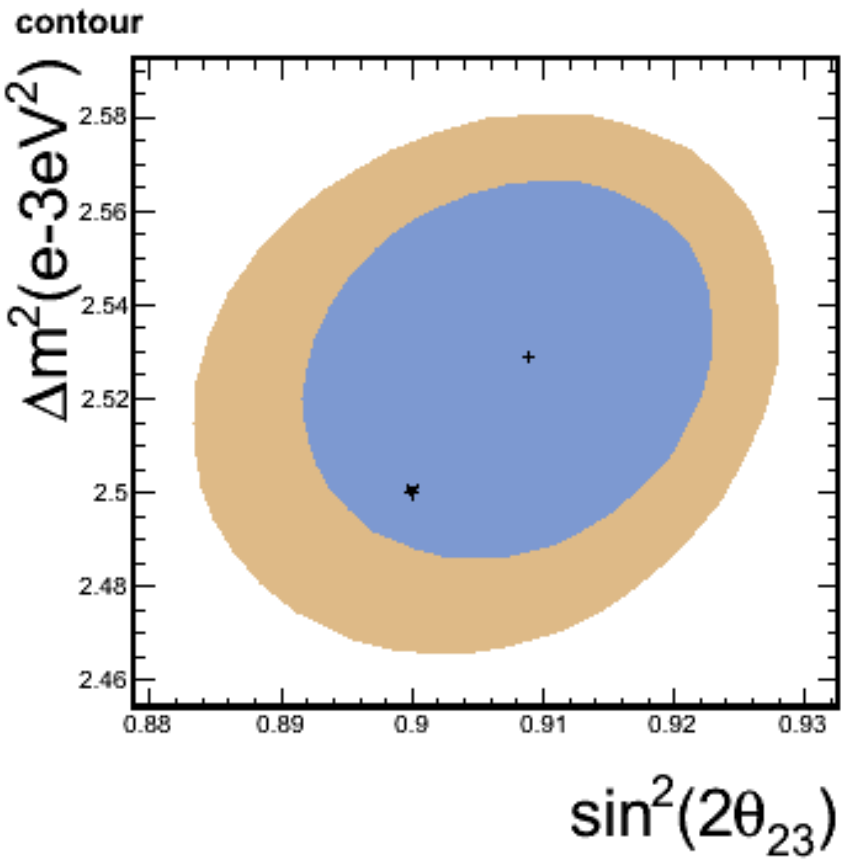

After applying flux ratio



# Fitting Result (-2mm)

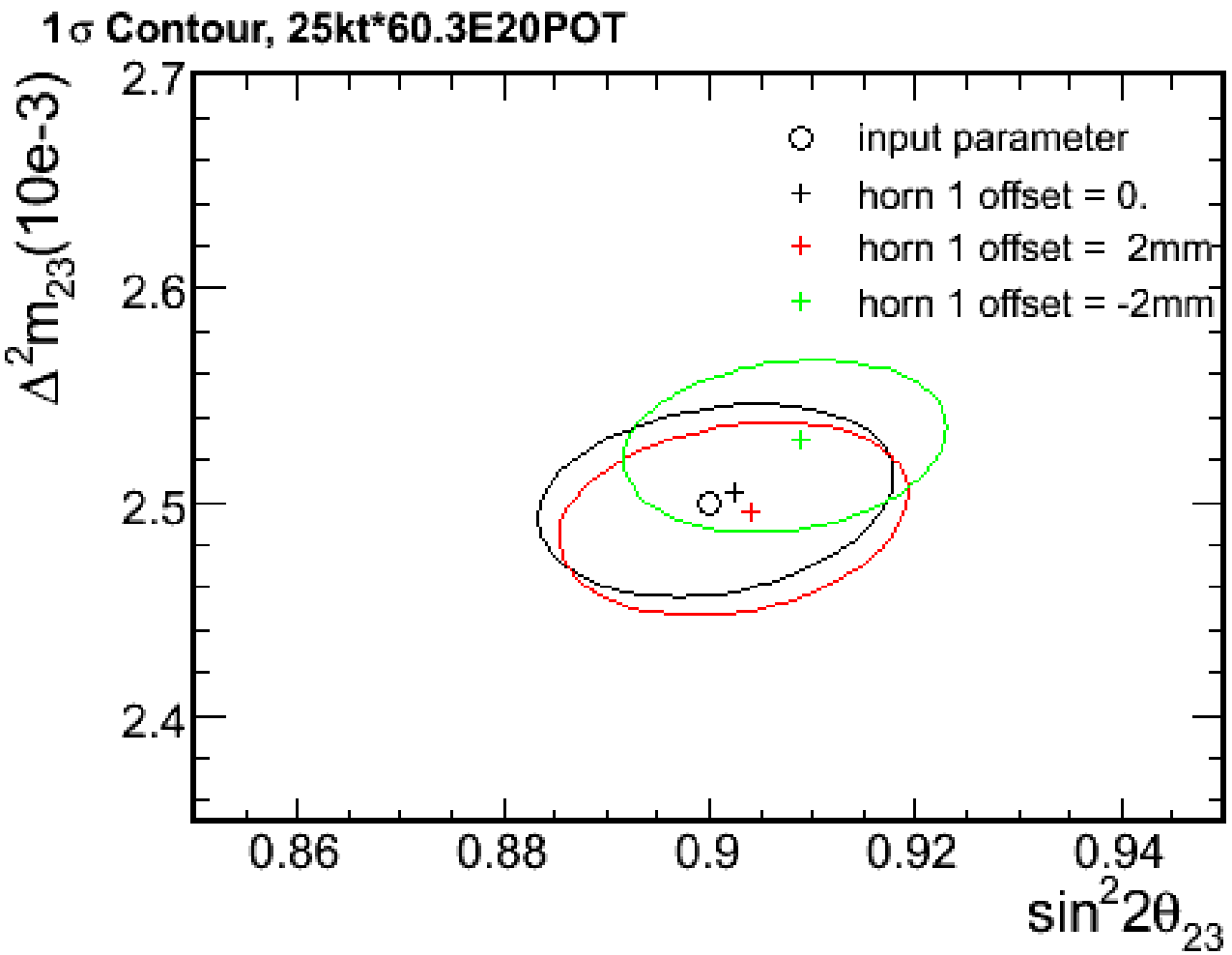


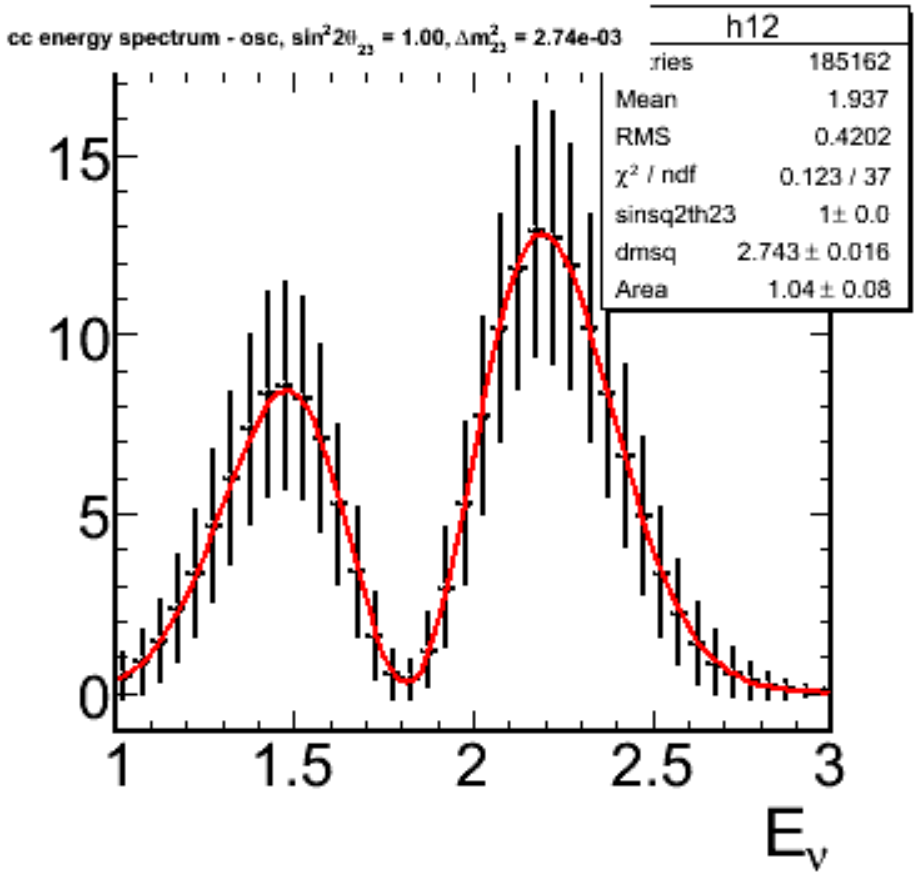

Assuming delta m^2 = 2.5e-3eV^-2, sin^2(2theta) = 0.9

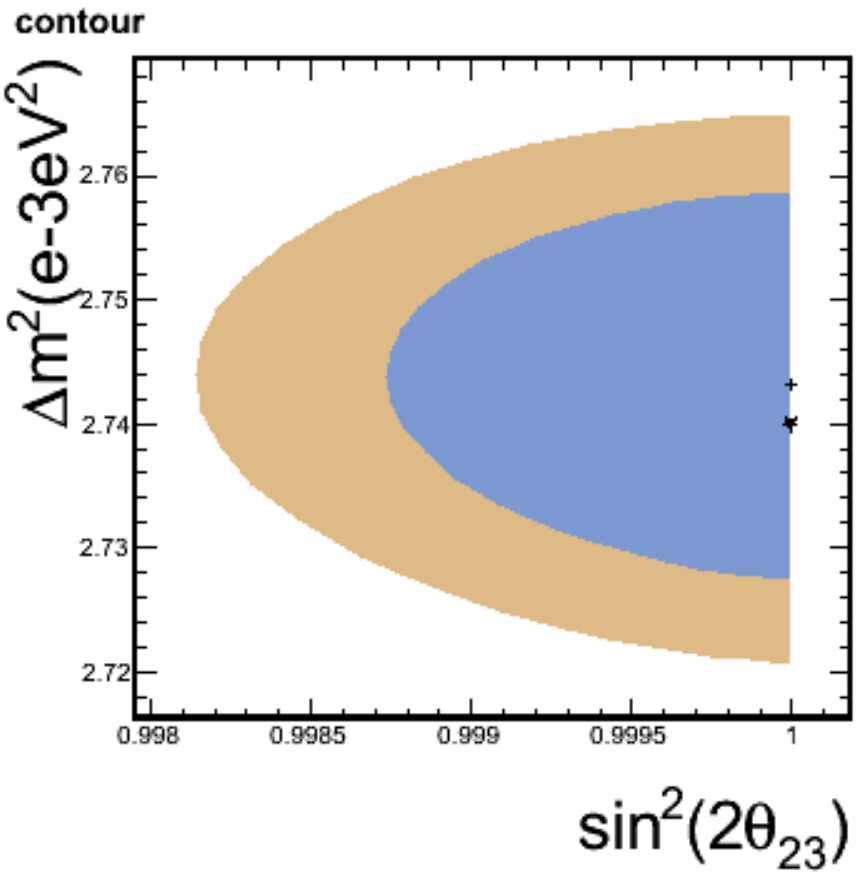
There is 1% shift in both best fit parameters.

# Contours


1σ Contour, 25kt*60.3E20POT
input parameter
horn 1 offset = 0.
horn 1 offset = 2mm
horn 1 offset = -2mm
$\Delta^2 m_{23}$(10e-3)
2.7
2.6
2.5
2.4
0.86
0.88
0.9
0.92
0.94
$\sin^2 2\theta_{23}$

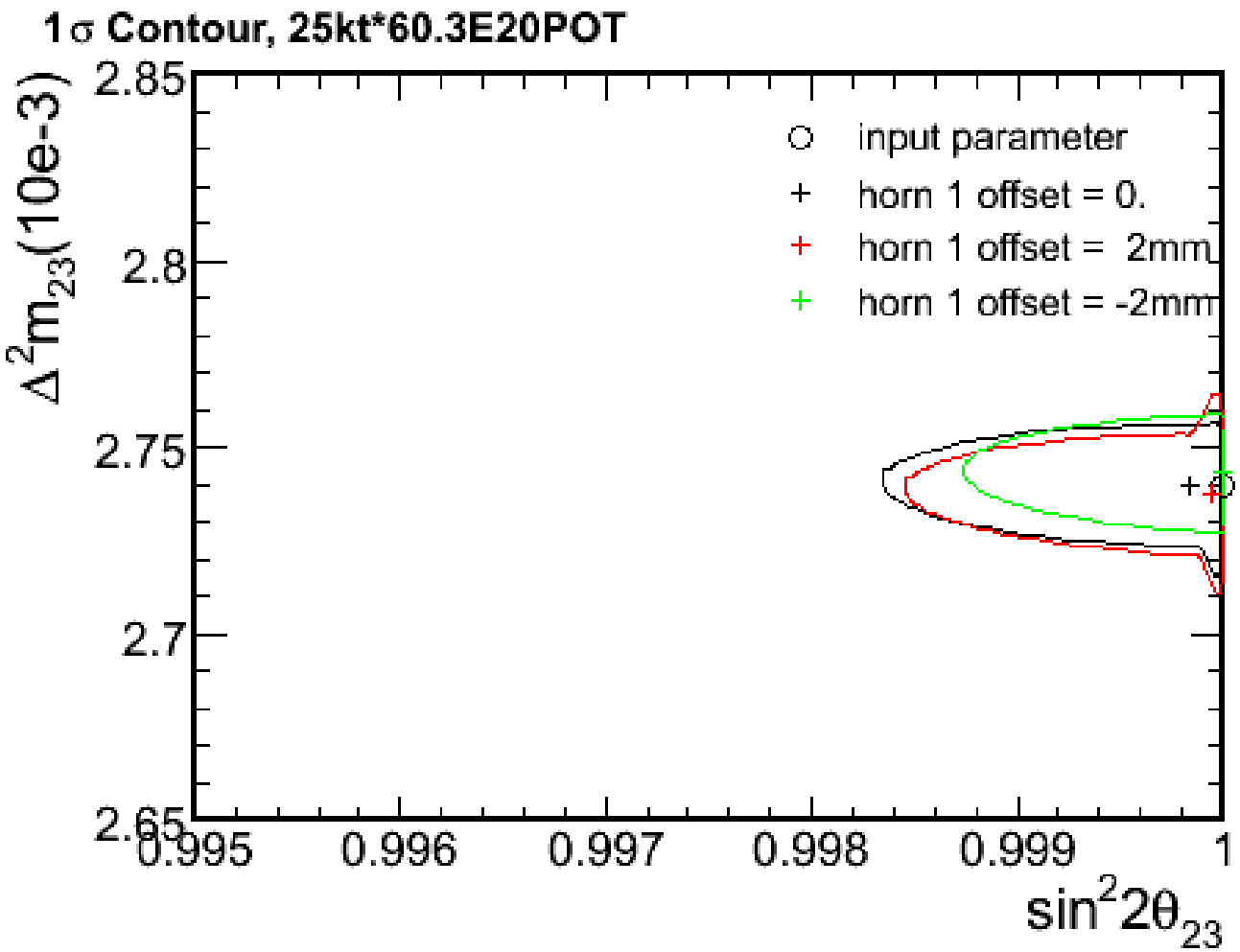
# Fitting Result (-2mm)




Assuming MINOS' best fit oscillation parameters: delta m^2=2.74e-3eV^-2 sin^2(2theta) = 1.

# Contours




The shift of best fit point is very small in all cases.

# Conclusions

- -2mm displace of horn 1 can give 1% systematic error in both sin^2 (2theta) and delta m^2 at sin^2(2theta)=0.9 delta m^2=2.5e-3eV^-2.
- When sin^2(2theta) approaches 1, the effect of the horn 1 display becomes negligible.