# $\pi^o$ invariant mass

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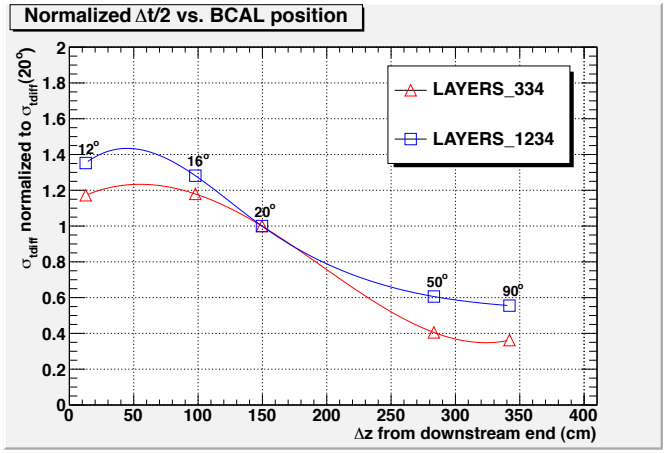
# BCAL Resolutions

granularity

| | |
|---|---|
| 334 | 6cm |
| 1234 | 4cm |

$$\sigma_\theta \begin{cases} \sigma_R = \dfrac{granularity(cm)}{5}\dfrac{1}{\sqrt{E}} \oplus 2mm \\ \sigma_z = \sigma_{tdiff} \cdot c_{eff} \qquad c_{eff} = 16.75cm \\ \sigma_{tdiff}(z) = \sigma_{tdiff}(20^\circ) \cdot spline(z) \end{cases}$$




$$\sigma_\phi = \frac{\Delta\phi}{5}\frac{1}{\sqrt{E}} \oplus 6mrad$$

$$\Delta\phi = \frac{2\pi}{(48modules)(4sectors)} = 32.7mrad$$

$$\frac{\sigma_E}{E} = \frac{5.7\%}{\sqrt{E}} \oplus 2.3\%$$

# FCAL Resolutions

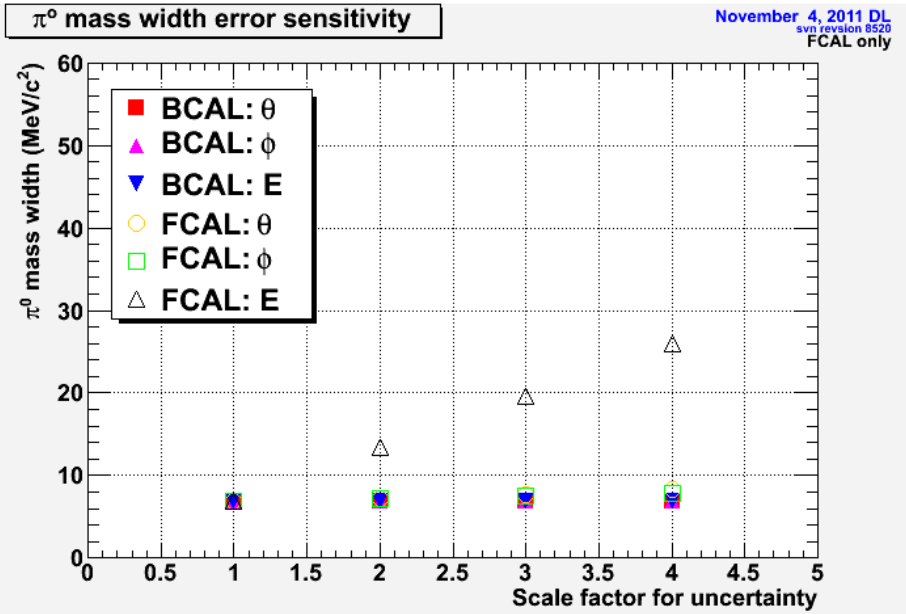
$$\sigma_\theta = \sigma_r \cdot \frac{\partial}{\partial r}\theta = \sigma_r \frac{L}{L^2 + R^2}$$

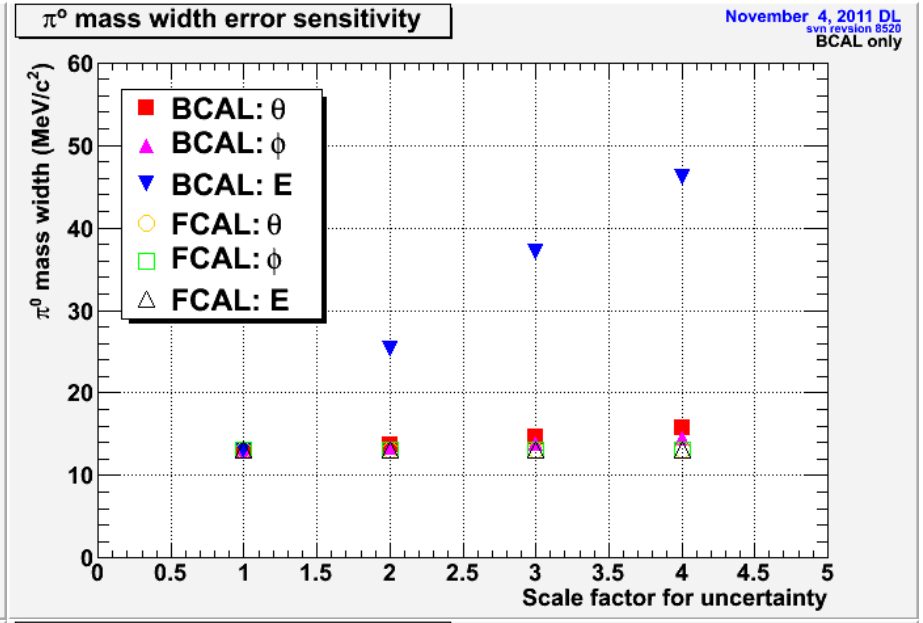
$$\sigma_r = \frac{6.4mm}{\sqrt{E}}$$

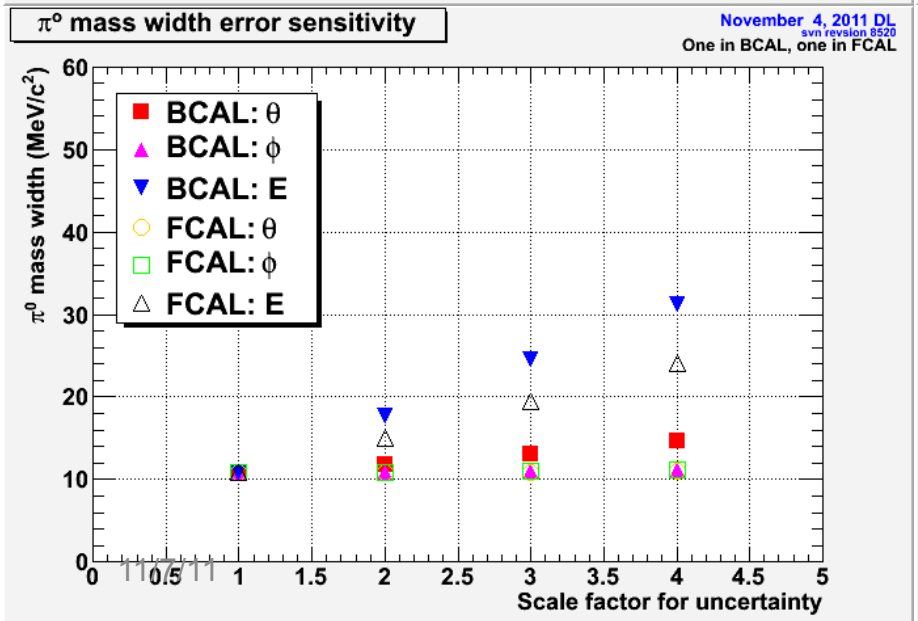
$$\sigma_\phi = arctan(\frac{\sigma_r}{r})$$

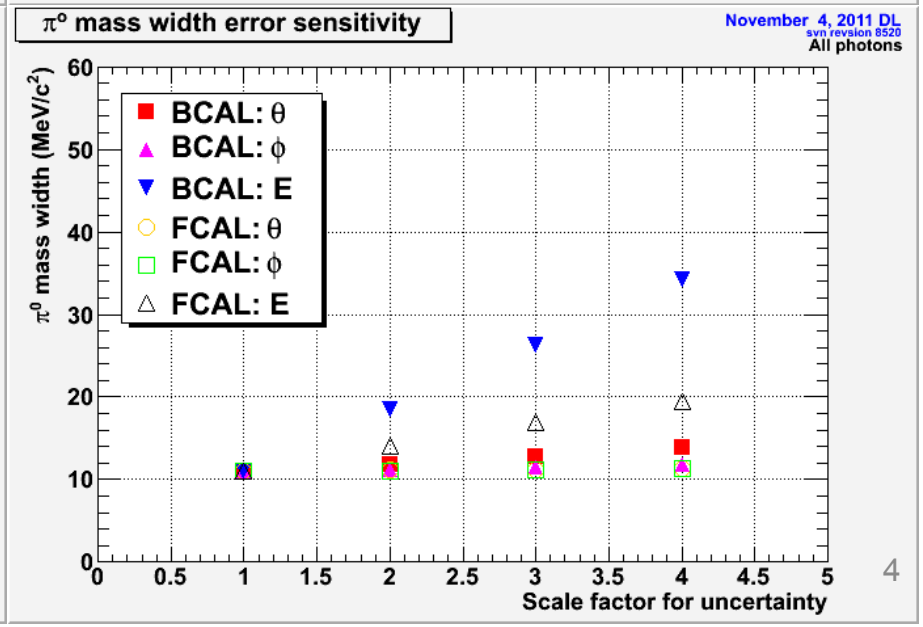
$$\frac{\sigma_E}{E} = \frac{5.6\%}{\sqrt{E}} + 0.6\%$$

# Resolution Contributors



# Summary

- $\pi^o$ invariant mass appears is most sensitive to energy resolution and does not appear to be significantly affected by time difference resolution