Previous issues: Small offsets in ytar and ztar
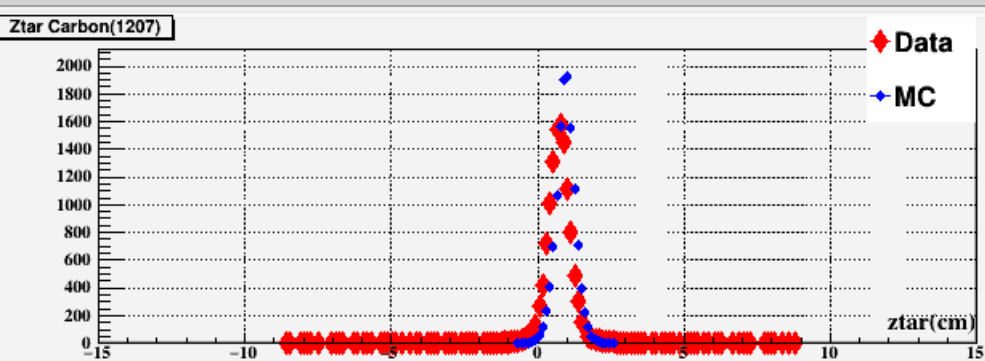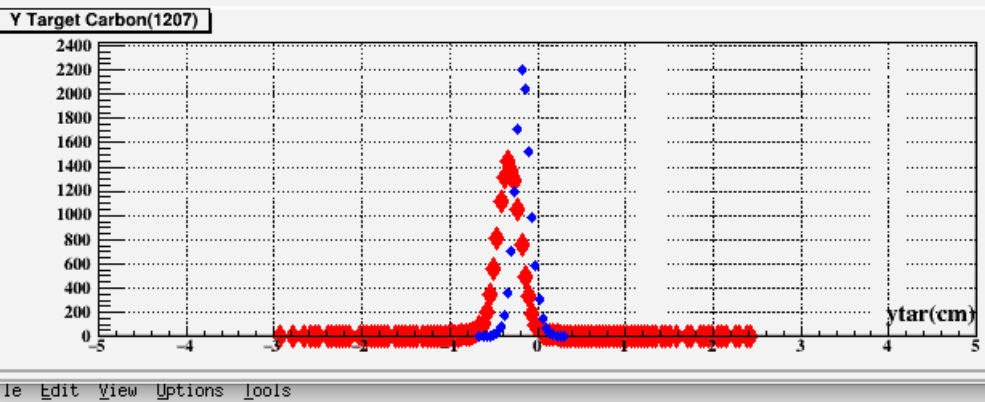
- If things are correct: if ztar match so should ytar
  - Roughly ztar = ytar/sin(θ)

$$Z_{react} = -Y_{coff} \times aa_1 - X_{beam, recon} \times aa_2$$

$$\begin{cases} aa_1 = \dfrac{\cos(arg1)}{\sin(arg1 + \sin\phi_{spec}\,\theta_0)} \\ aa_2 = \cot(arg1 + \sin\phi_{spec}\,\theta_0) \end{cases}$$
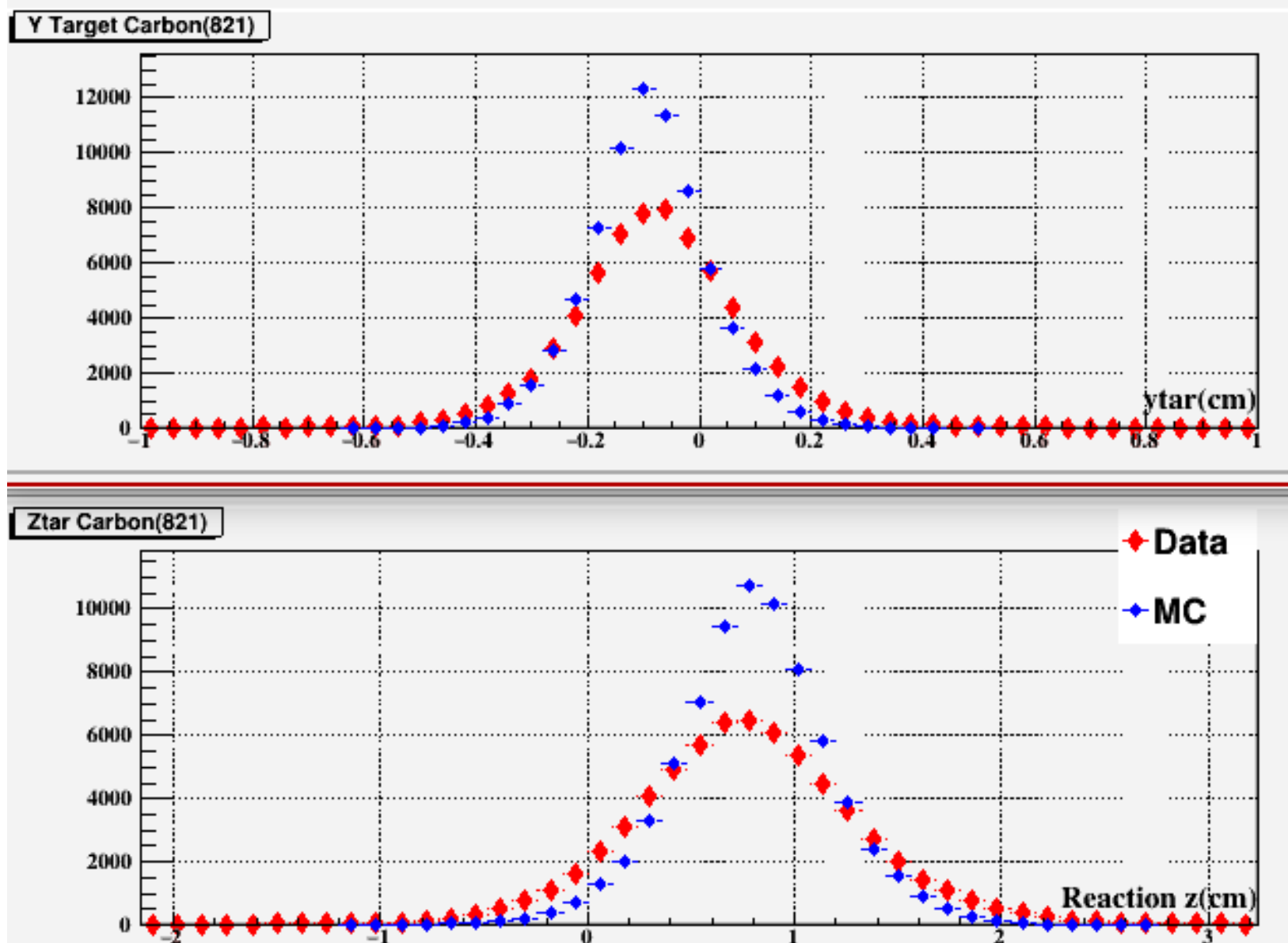
$$Y_{coff} = Y_{tar} + D - Z_{off}(\phi_{tar} - \phi_{off})$$

$$arg1 = \arctan(\phi_{tar} - \phi_{off})$$

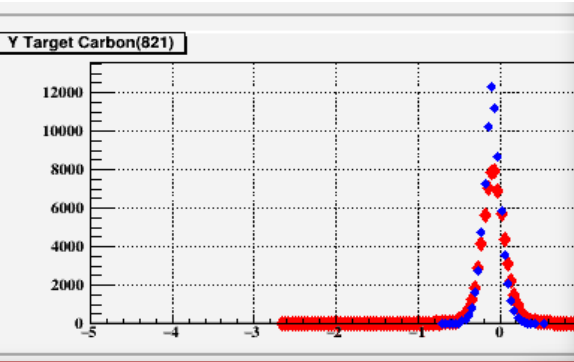$$X_{beam,\ (recon \, shower)} = targ\% \times offset + Main\% target\% \ raster\ x$$

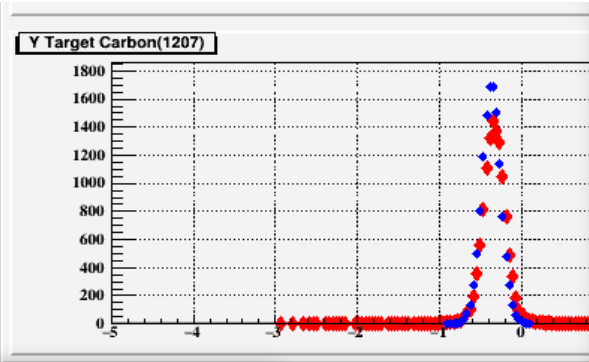Thanks to Shujie! Found bug inside the event generator missing a contributing offset in the reconstruction of Ztar.

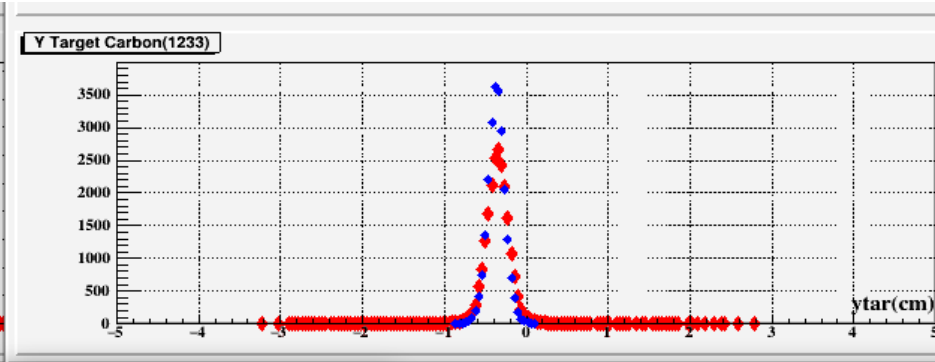# Raster off, Carbon foil, p0=2.14GeV, Eb=6.14GeV, θ=17.005 from dec.

Run 821 (dec) ; 1207(kin 1) ; 1233(kin2) ztar offset = 0.8 cm

Y Target Carbon(821)

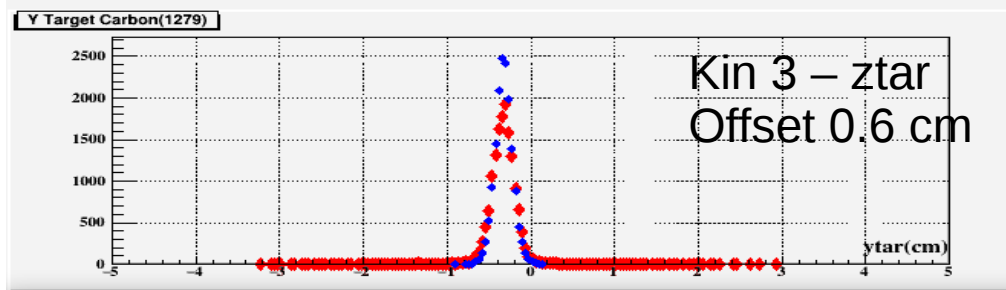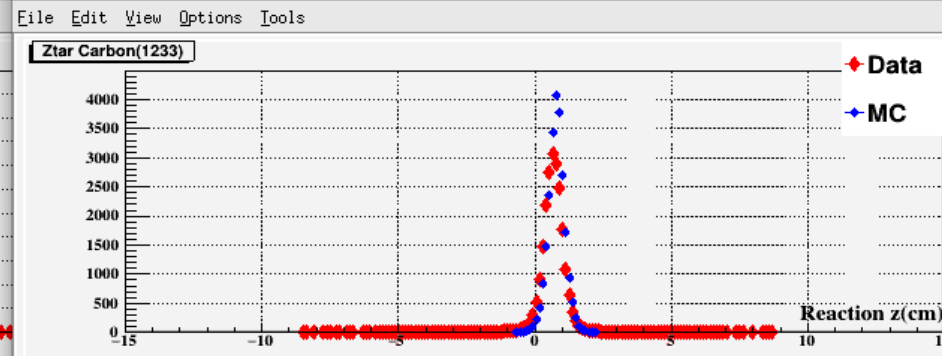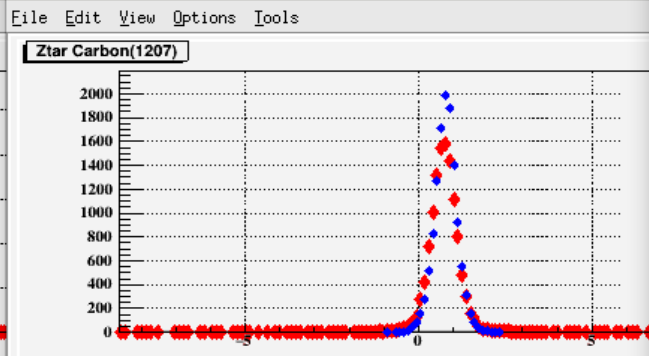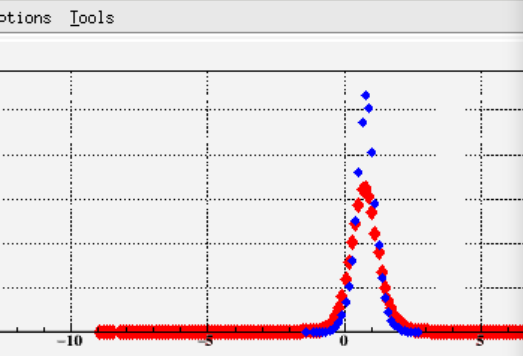Y Target Carbon(1207)

Y Target Carbon(1233)

ytar(cm)

Canvas 4 for run 821

Canvas 4 for run 1207

Canvas 4 for run 1233

Options Tools

File Edit View Options Tools

File Edit View Options Tools

Ztar Carbon(1207)

Ztar Carbon(1233)

Data

MC

Reaction z(cm)

Y Target Carbon(1279)

Kin 3 – ztar
Offset 0.6 cm

ytar(cm)

Y Target Carbon(2568)

Kin 4 – ztar
Offset 0.875 cm

ytar(cm)

Canvas 4 for run 1279

File Edit View Options Tools

Ztar Carbon(1279)

Data

MC

Reaction z(cm)

Ztar Carbon(2568)

Data

MC

Reaction z(cm)
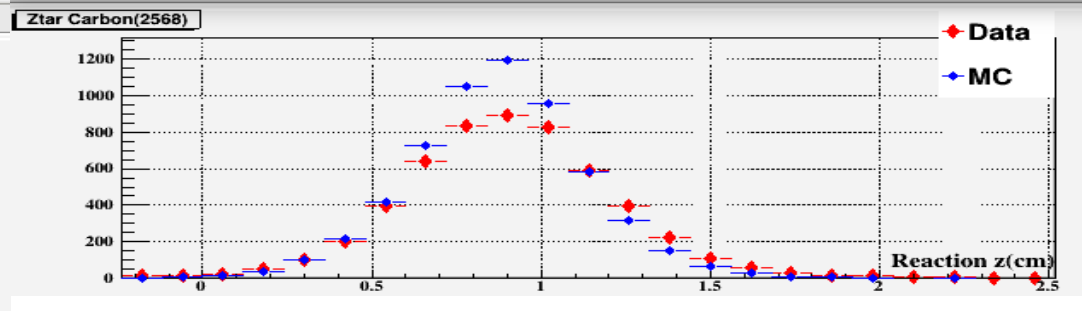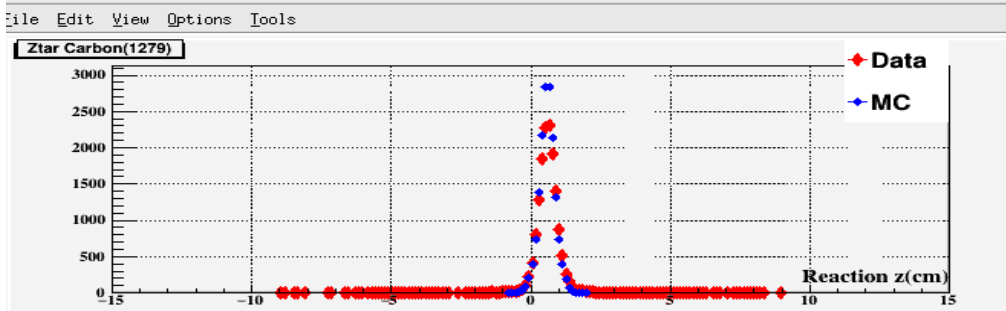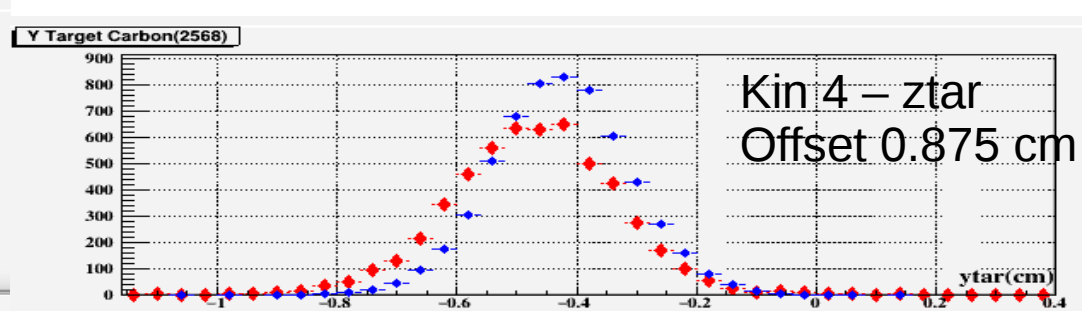
Moving Forward

- Determine Y offsets for each kinematic

- Determine if the after transformer failure kinematics seem similar issue as the kin4 (2568 run)

- Update the Monte carlo with a way to implement the offset on kinematic basis.