

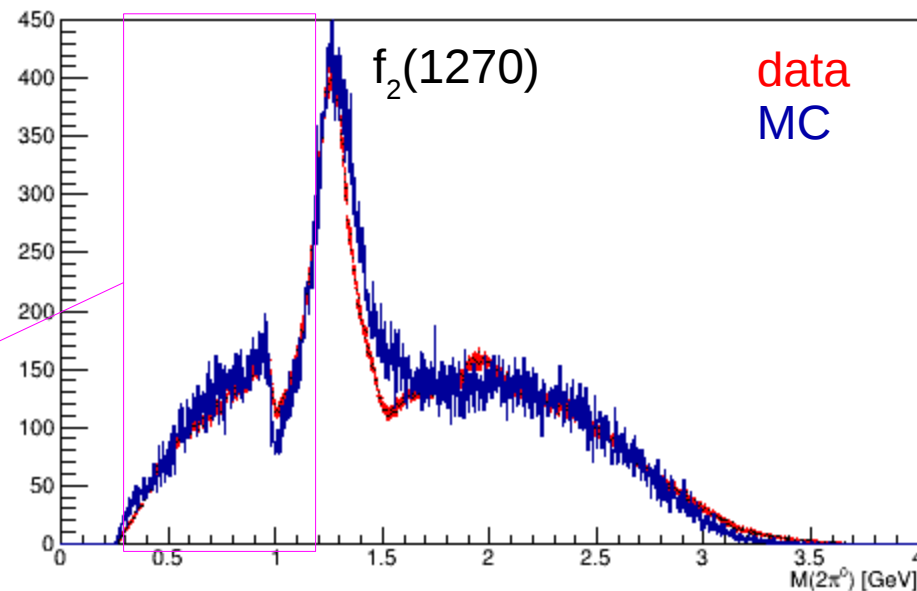
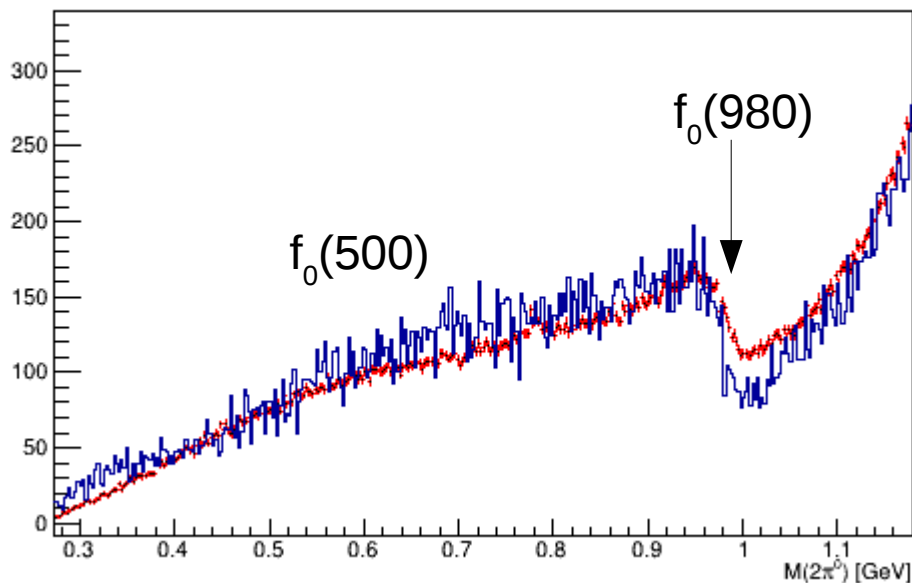
# Simulation update/thoughts

Simon Taylor / JLab

- Need to continue to revisit simulation with smaller insert (compared to proposal) and updated reconstruction code (including Island Algorithm for FCAL2 clusters)
  - Need better model for  $\pi^0\pi^0$  background (underestimated in proposal)
    - Developed new genScalarRegge code for this purpose
  - Suppression of  $\eta\rightarrow 2\gamma$  and  $\eta\rightarrow 3\pi^0$  backgrounds
    - Generated 10M  $\eta\rightarrow 2\gamma$  events and 8.3M  $\eta\rightarrow 3\pi^0$  events to study these

# Simulation of $2\pi^0$ background

- Generated events using *genScalarRegge* based on a Regge model by Donnachie and Kalashnikova for scalar meson production and a different Regge model by Xie and Oset for tensor meson ( $f_2(1270)$ ) production
  - Includes  $f_0(500)$  (“ $\sigma$ ”),  $f_0(980)$ ,  $f_2(1270)$
  - Also includes non-resonant  $\pi^0\pi^0$  production
  - Tuned coupling constants for all resonances and shape parameters for  $f_0(500)$  to data
  - Interference terms allowed
  - Does not include baryon backgrounds



# Simulation of $2\pi^0$ background

- Angular distribution of one  $\pi^0$  in rest frame of  $\pi^0\pi^0$  system

