# H4 Primex Data, $\pi^0\pi^0$ Final State

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April 19, 2020

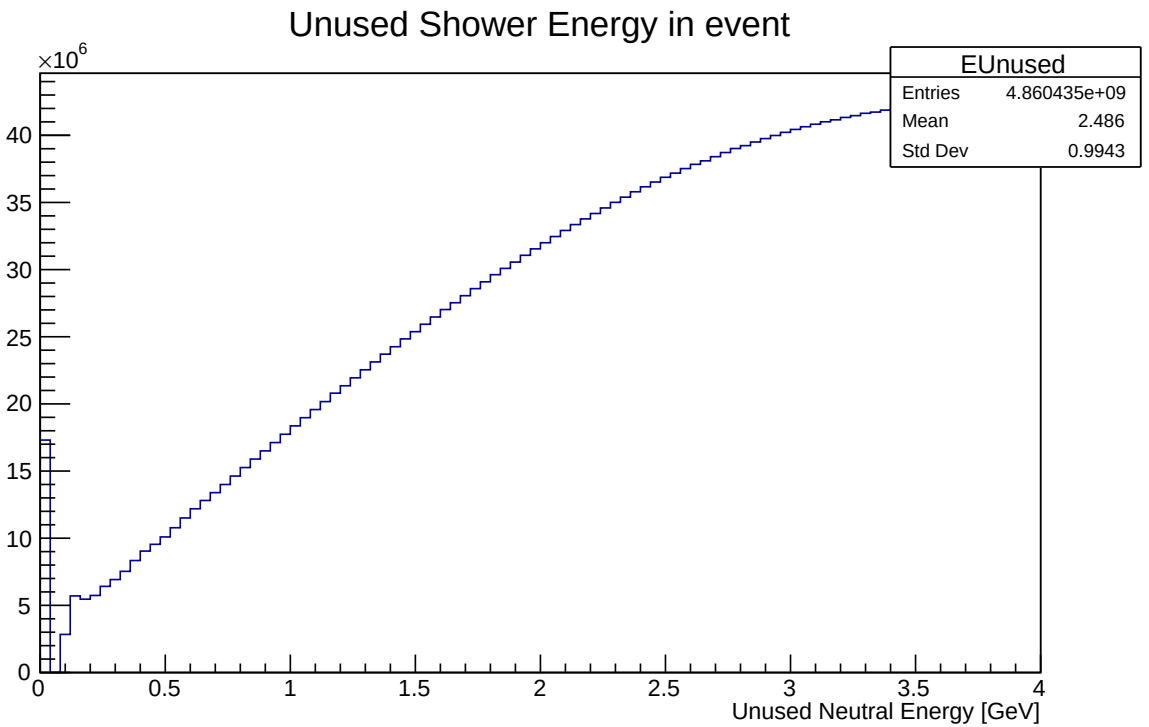
# $\pi^0\pi^0$ System in He4 Primex data

Look at the Primex He4 data and explore the response of the invariant mass of the $\pi^0\pi^0$-System with regards to varius cuts.

- No unsued energy
- No charged tracks -> We want magnet on with DC!
- Beam Energy, Chi2 of kin fit, Vertex
- Invariant mass of the $\pi^0$s
- Kinetatic cuts: $\theta$, -t, $M_{\pi^0}$
- Energy Balance

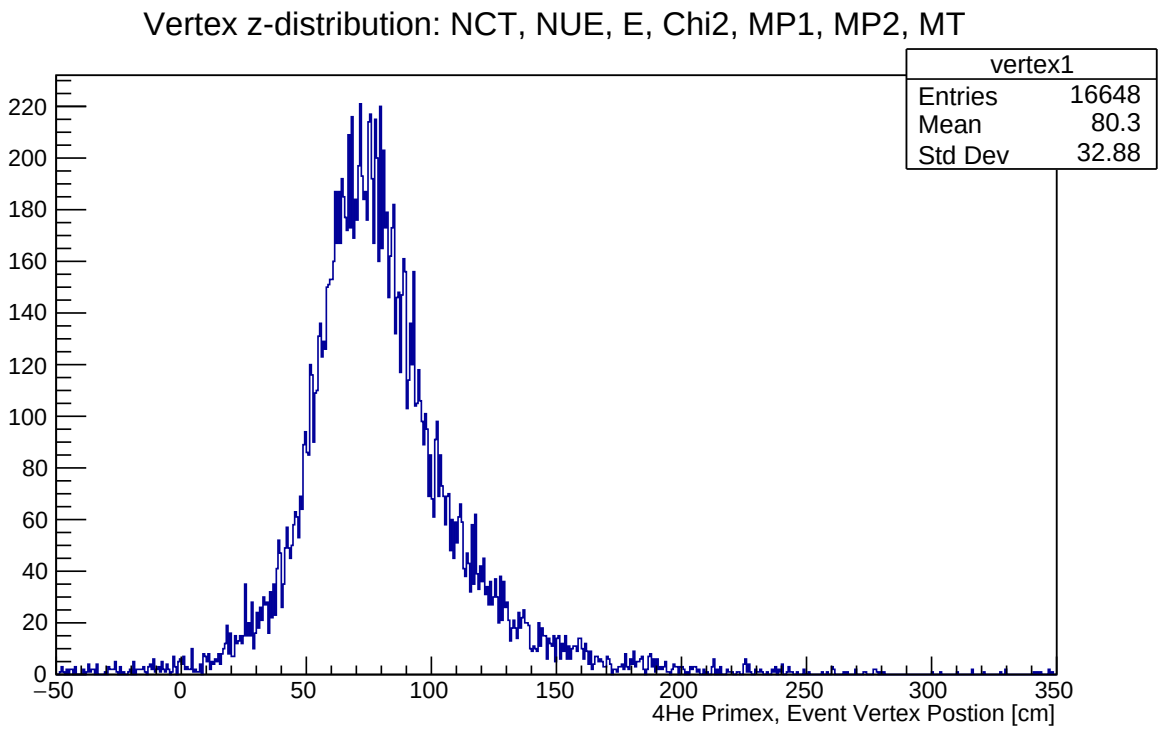
# Example of some cuts

Some basic cut example, like:
Cuting on unused energy:



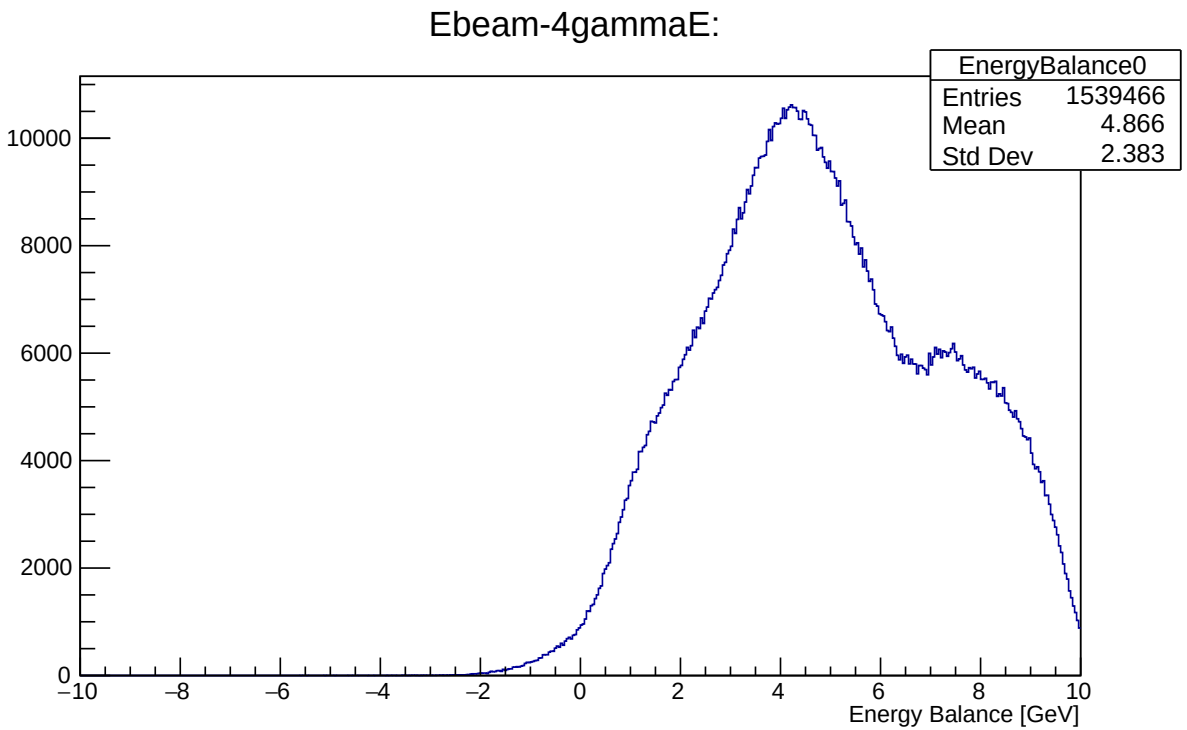
# Example of some cuts

Some basic cut example, like:
Cuting on vertex:



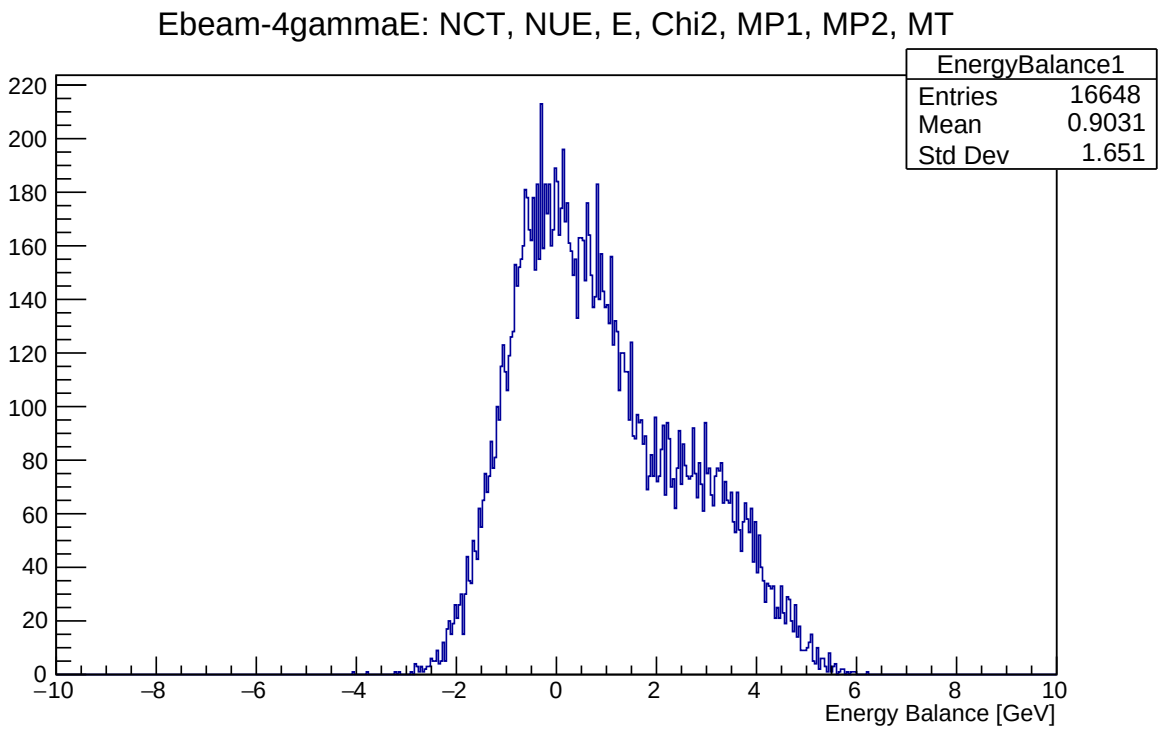
# Example of some cuts

Some basic cut example, like:
Cuting on Energy Balance (no cuts):



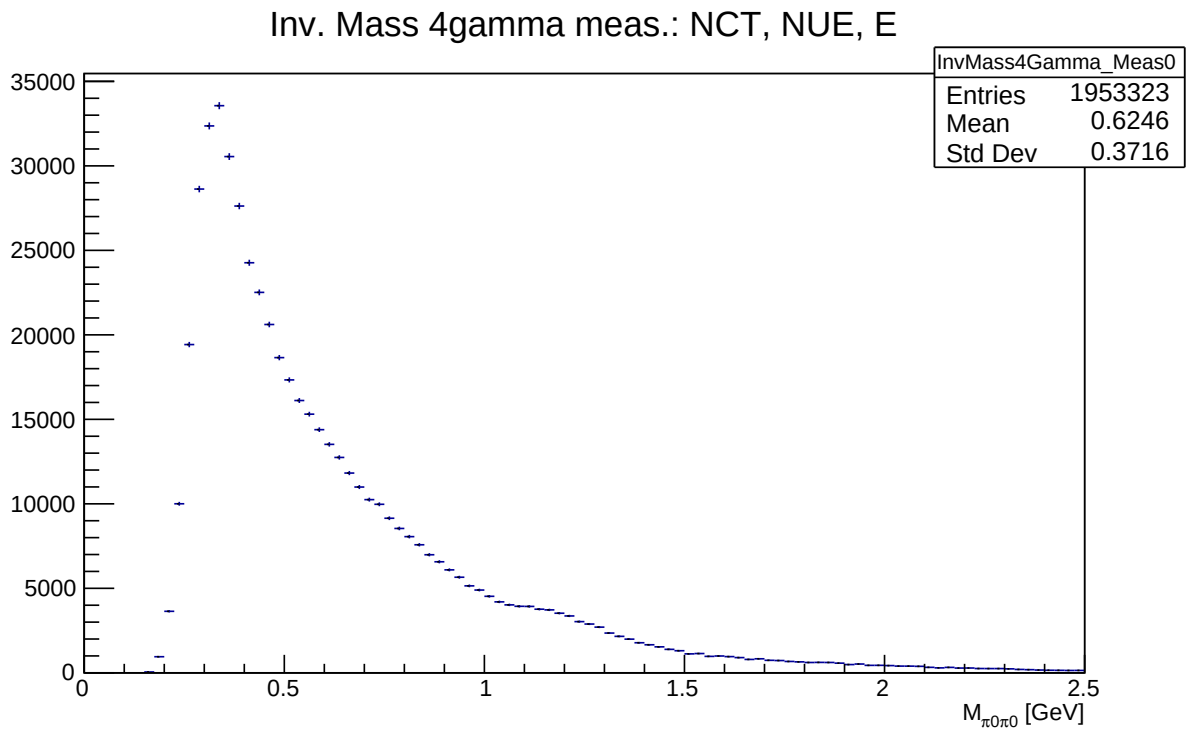
# Example of some cuts

Some basic cut example, like:
Cuting on Energy Balance (some cuts):



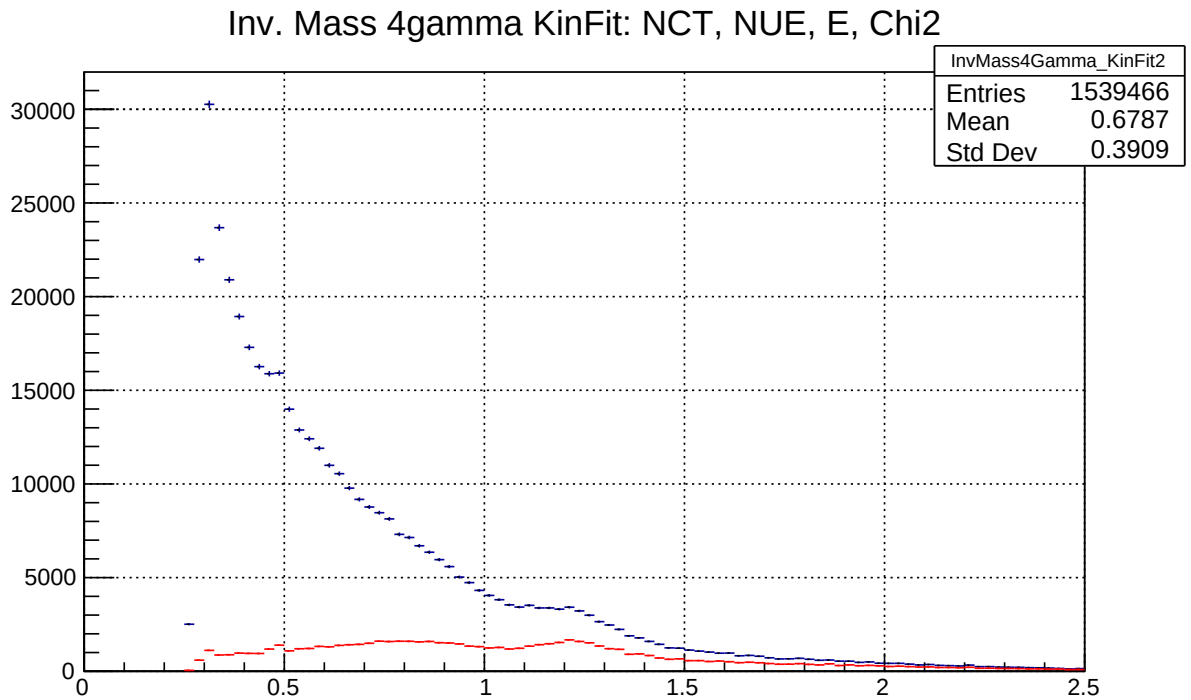
# Inv Mass of $\pi^0\pi^0$

Look at Inv. Mass of 2pi system with cuts:
CUTS: NCT, NuE, E; Measured Inv. Mass.



# Inv Mass of $\pi^0\pi^0$

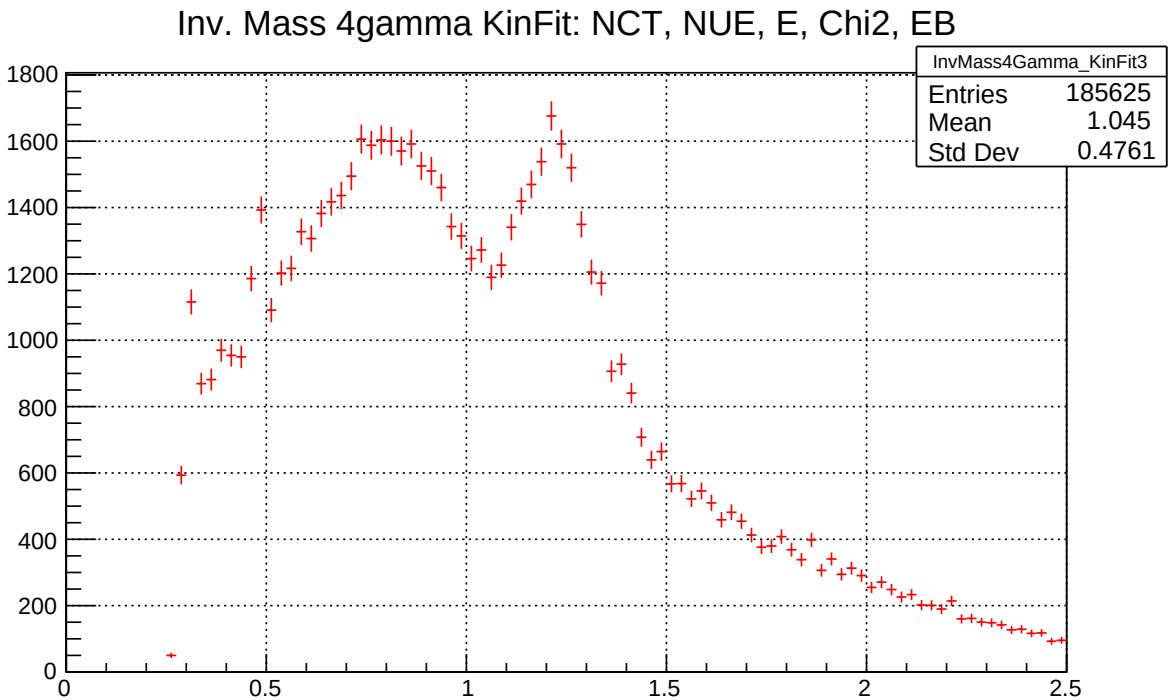
Look at Inv. Mass of 2pi system with cuts:
CUTS: NCT, NuE, E, Chi2; Kin Fit Mass.




Low energy background requires Energy Balance cut!

# Inv Mass of $\pi^0\pi^0$

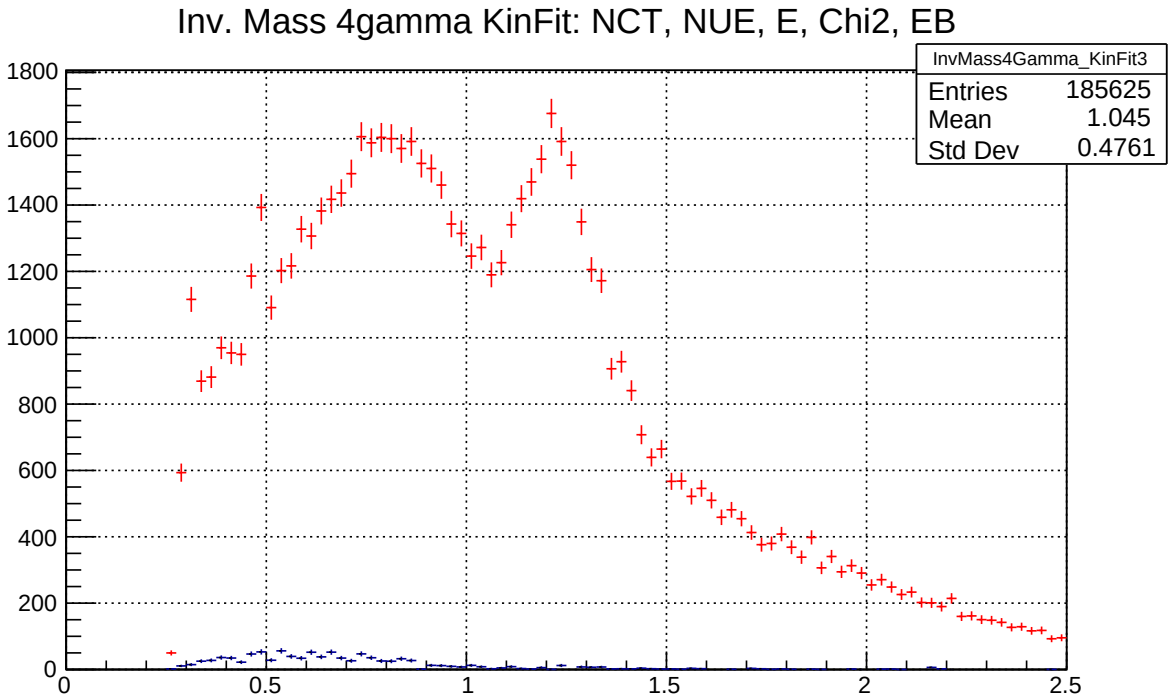
Look at Inv. Mass of 2pi system with cuts:
CUTS: NCT, NuE, E, Chi2 AND EB; Kin Fit Mass.




EB cut does the trick!

# Inv Mass of $\pi^0\pi^0$

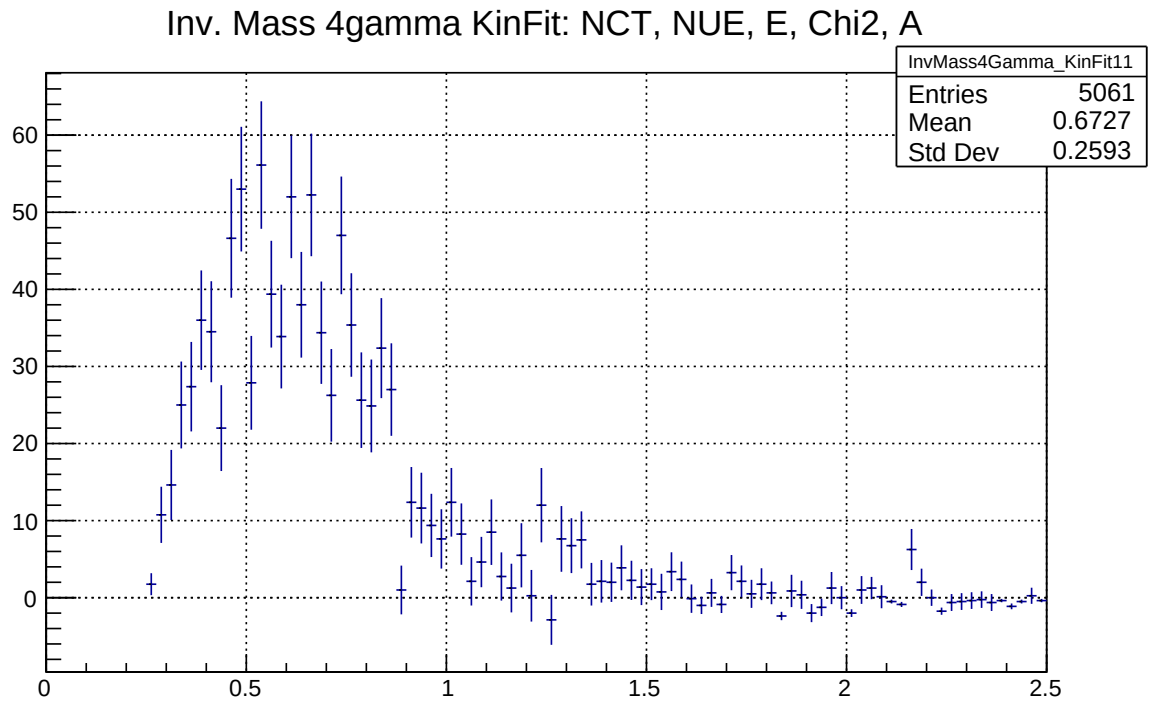
Look at Inv. Mass of 2pi system with cuts:
CUTS: NCT, NuE, E, Chi2, ..all cuts; Kin Fit Mass.




And all other cuts like -t, *theta*, ....

# Inv Mass of $\pi^0\pi^0$

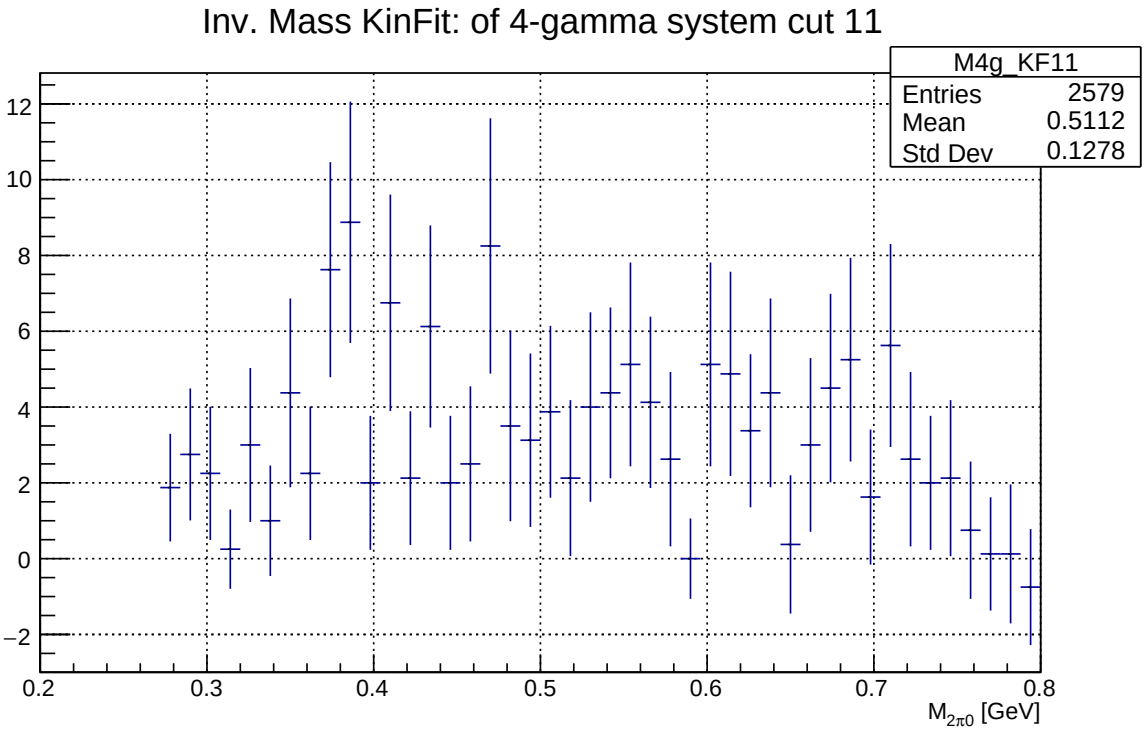
Look at Inv. Mass of 2pi system with cuts:
CUTS: NCT, NuE, E, Chi2, ..all cuts; Kin Fit Mass.




with all cuts.

# Inv Mass of $\pi^0\pi^0$

Look at Inv. Mass of 2pi system with cuts:
CUTS: NCT, NuE, E, Chi2, ..all cuts; Kin Fit Mass.




with all cuts and -t<0.05 low E region only.