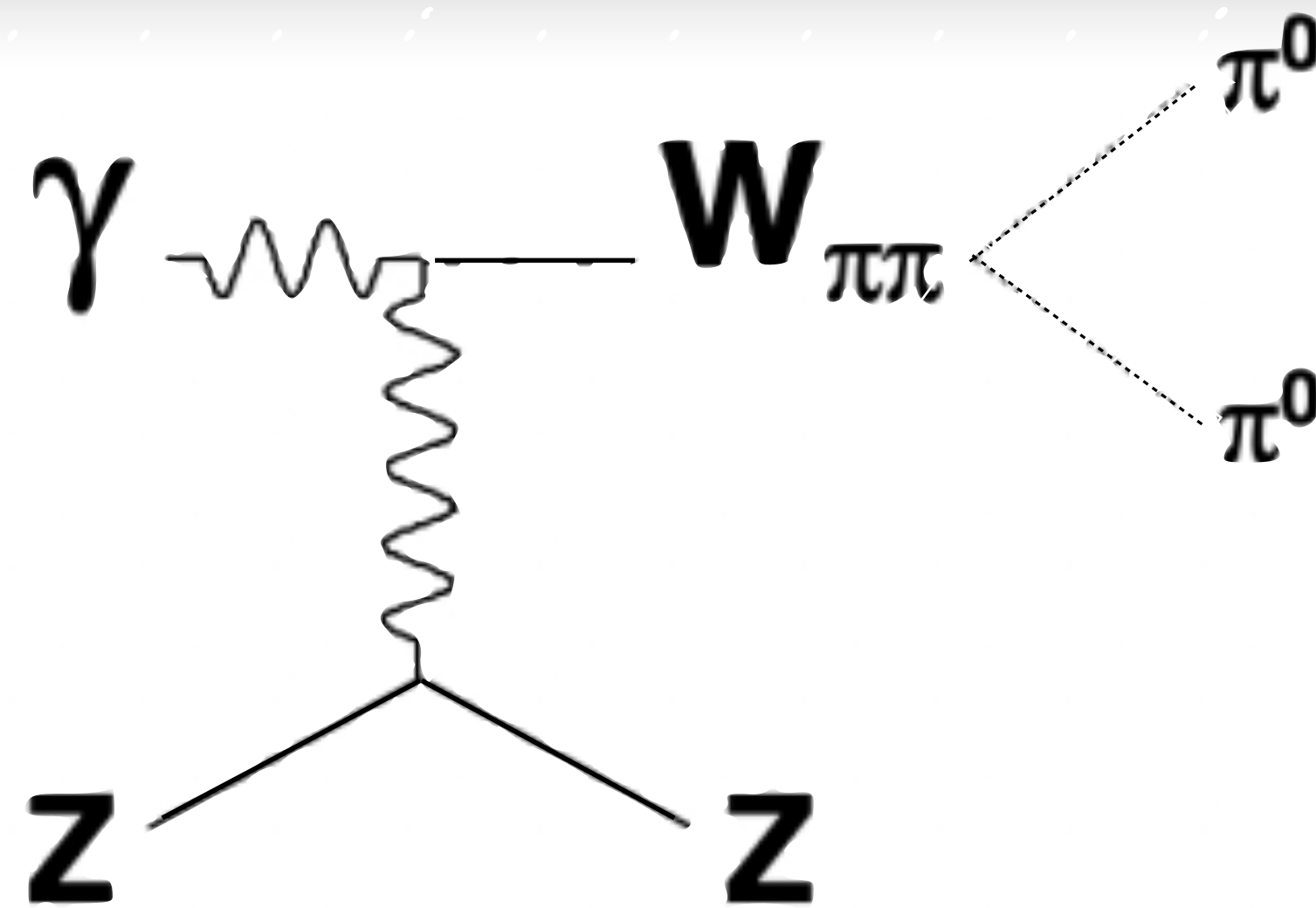


Examining Potential Backgrounds for NPP in the GlueX Data Set

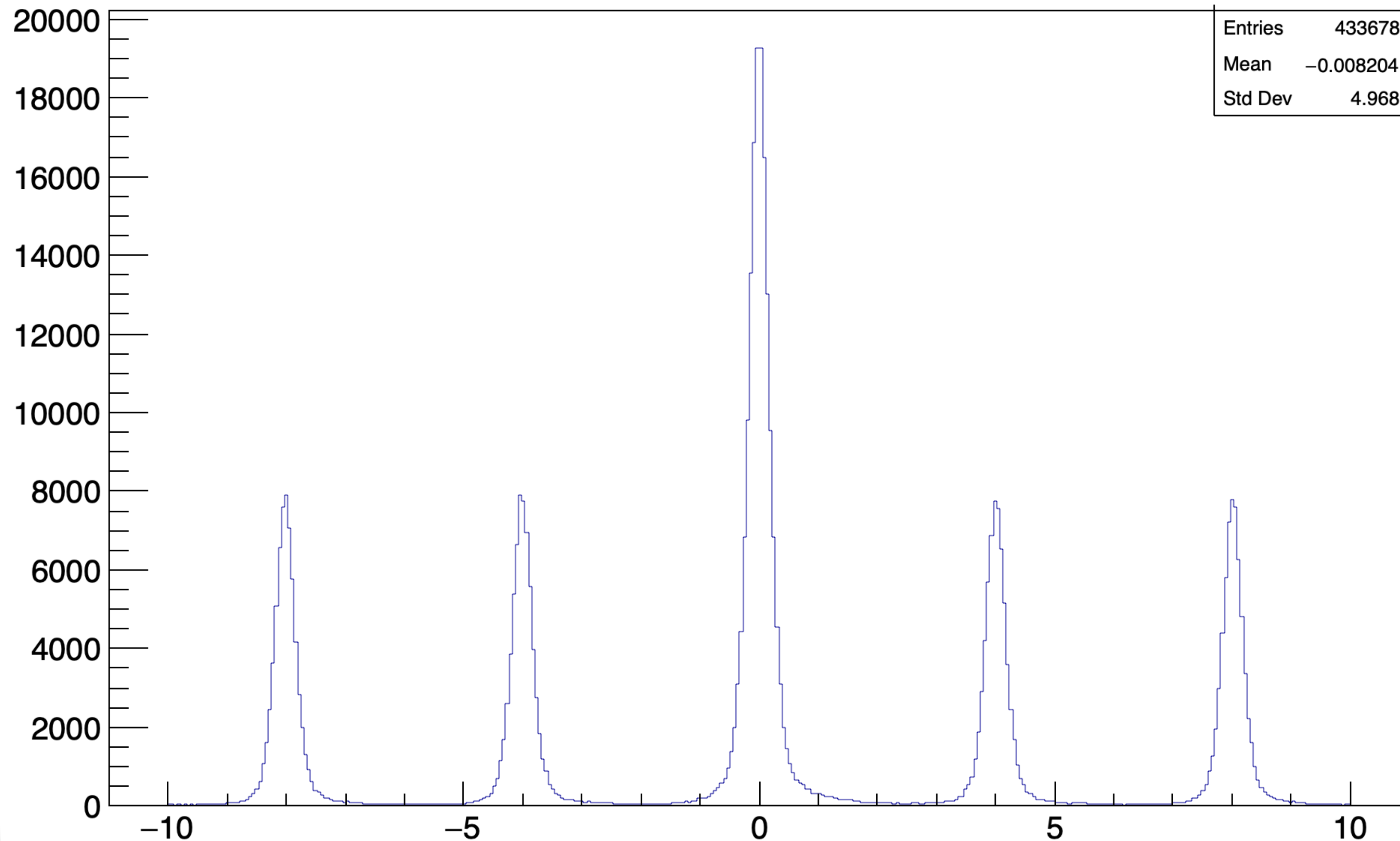


Iesa Khanji
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- **GlueX Data Set: Run 2017-01**
- **Reaction Filter: $\gamma p \rightarrow \pi^0 \pi^0 (p)$**
- **Requirements: No Extra Charged Tracks (No Recoil Proton)**
 - **No Unused Shower Energy**
 - **Beam Energy 4.5 to 12 GeV**
- **Cuts:**
 - **Invariant Mass Cut on Mass of π^0**
 1. $0.112 \text{ GeV} < W^{\pi^0 1} < 1.58 \text{ GeV}$
 2. $0.120 \text{ GeV} < W^{\pi^0 2} < 0.149 \text{ GeV}$
 - **If Photon Track in FCAL, $E_{FCAL} > 0.5 \text{ GeV}$**
 - **If Photon Track in BCAL, $E_{BCAL} > 0.3 \text{ GeV}$**

$\gamma p \rightarrow \pi^0 \pi^0(p)$ Reaction Filter, GlueX 2017 – 01 data

Vertex Time - Rftime

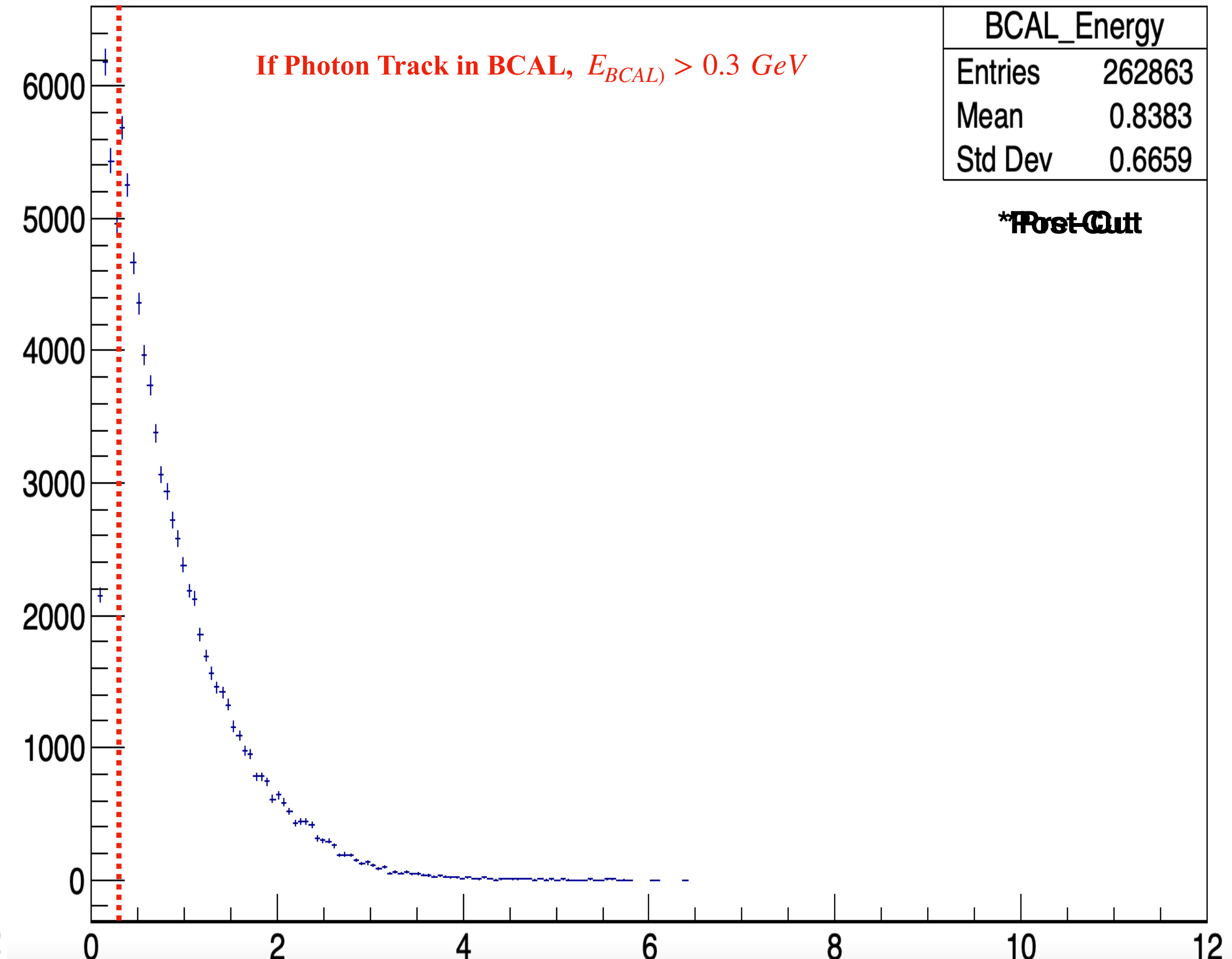
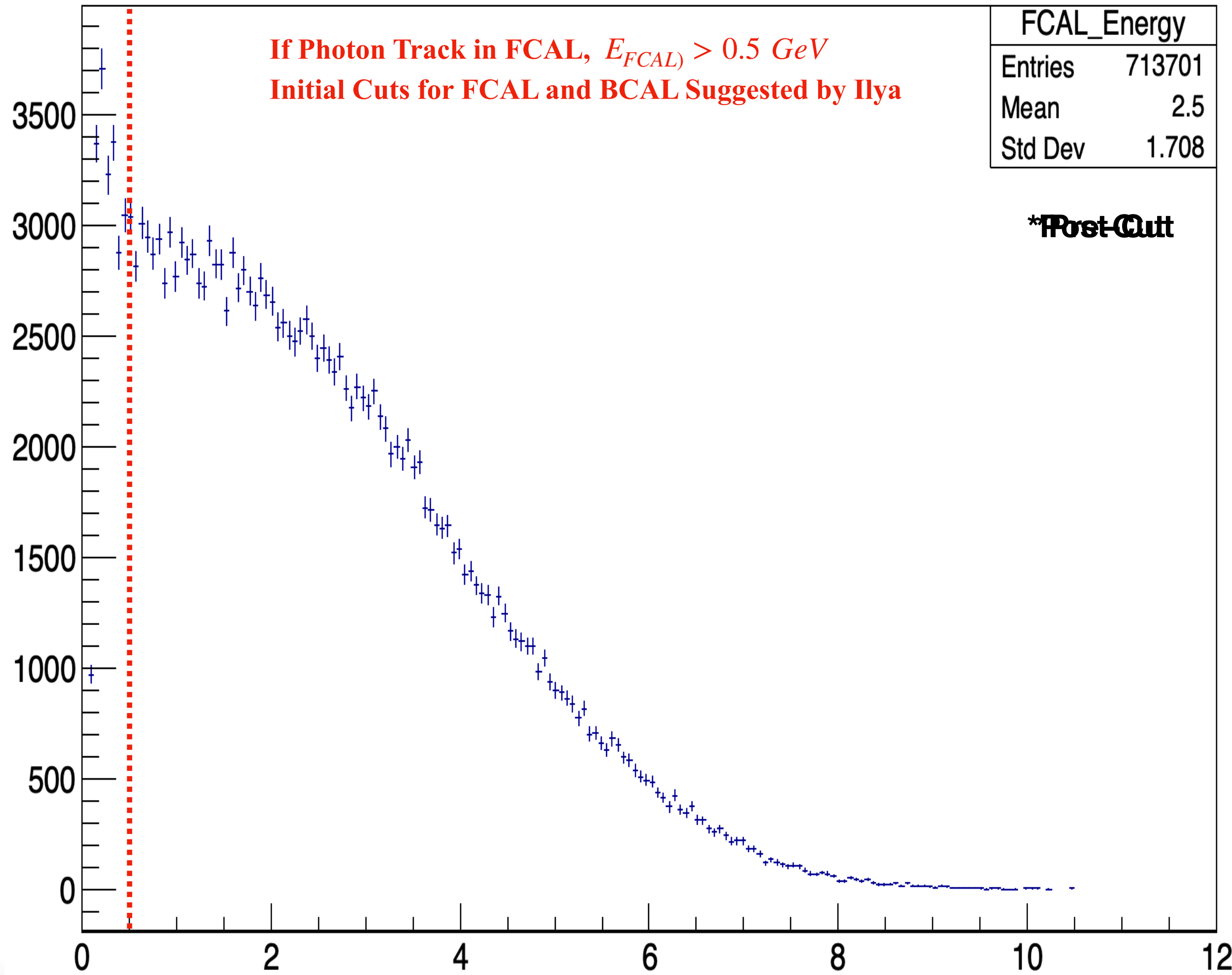


*All Histograms shown
are Accidental Subtracted

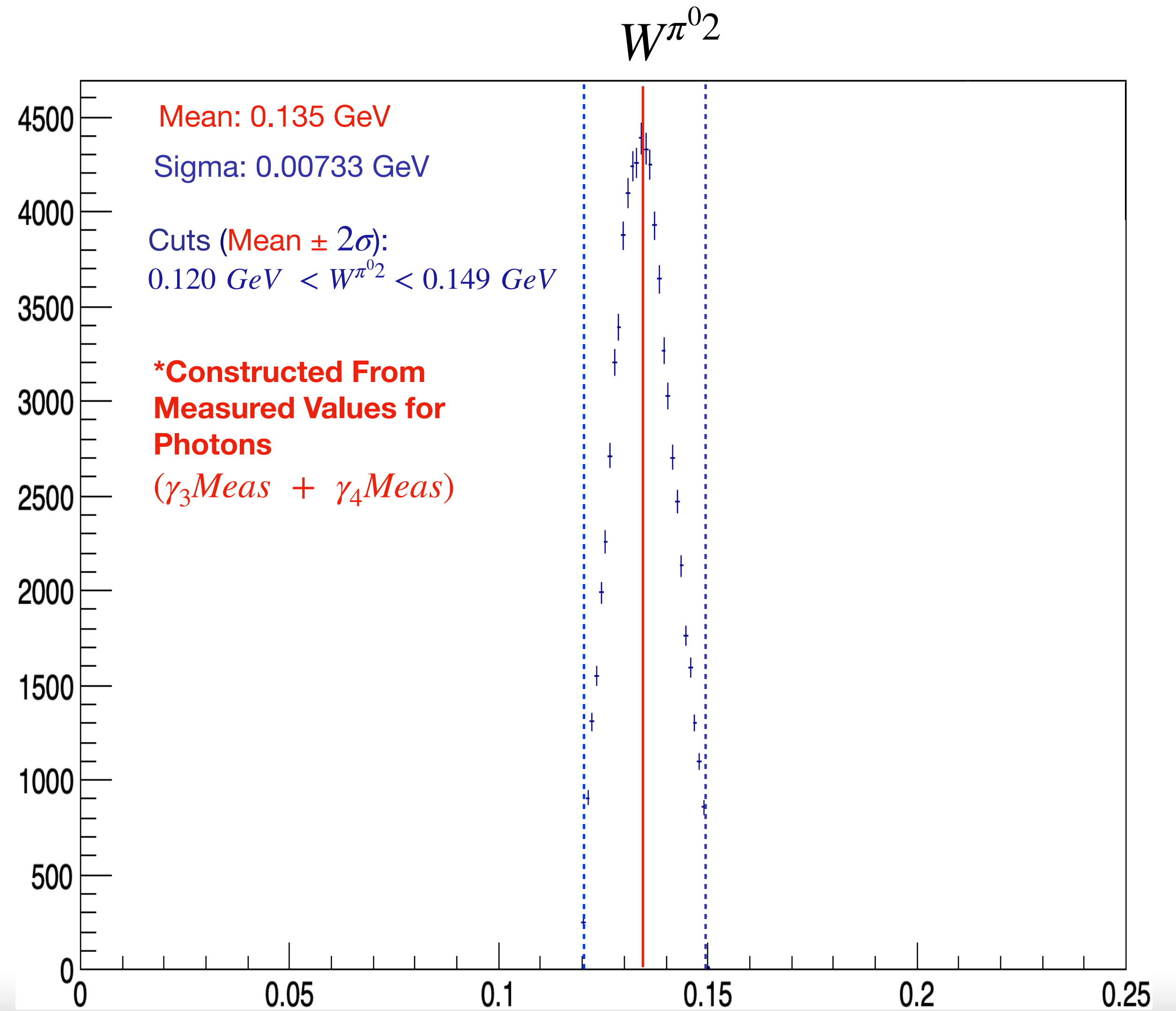
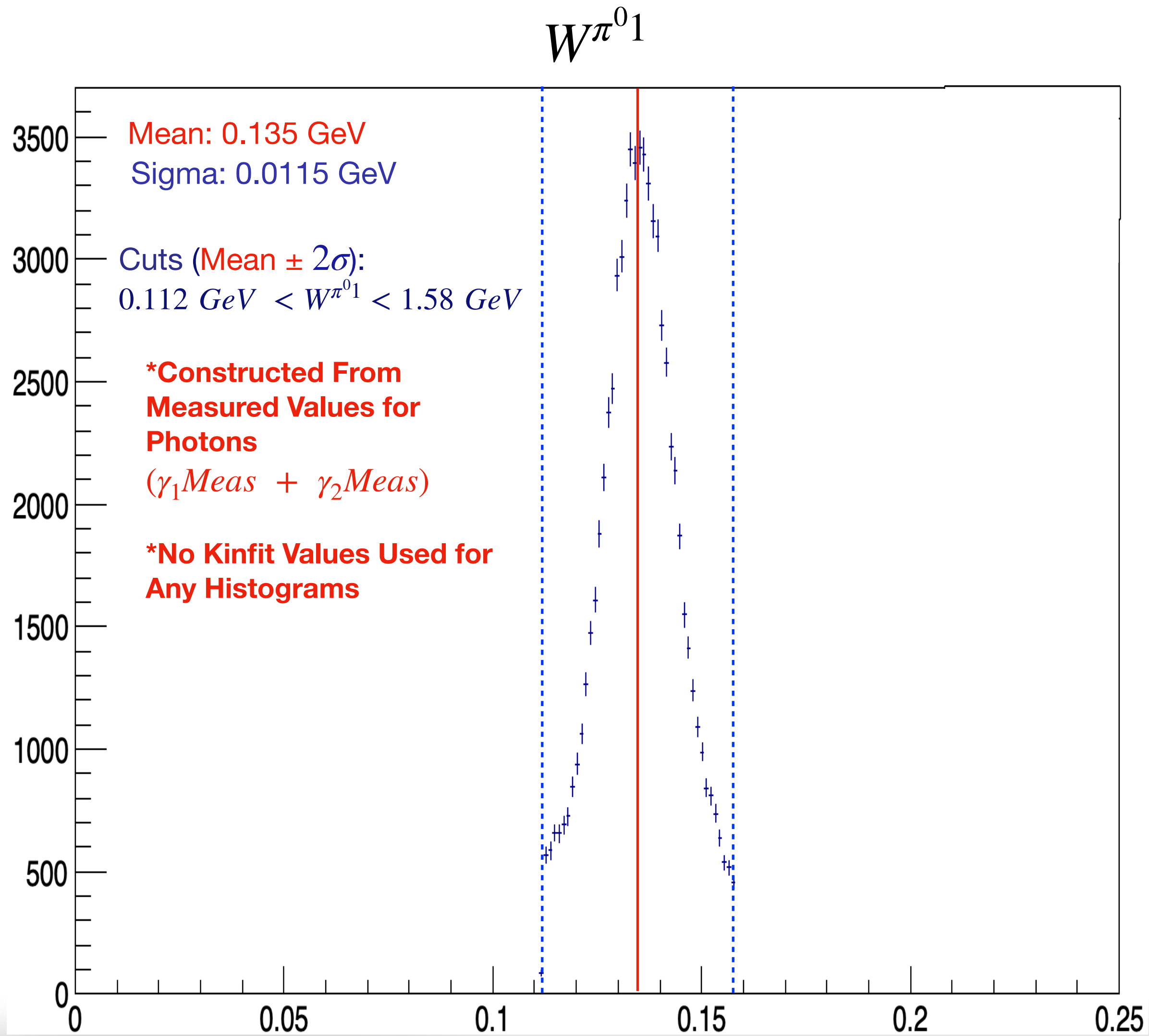
$\gamma p \rightarrow \pi^0 \pi^0(p)$ Reaction Filter, GlueX 2017 – 01 data

FCAL Energy

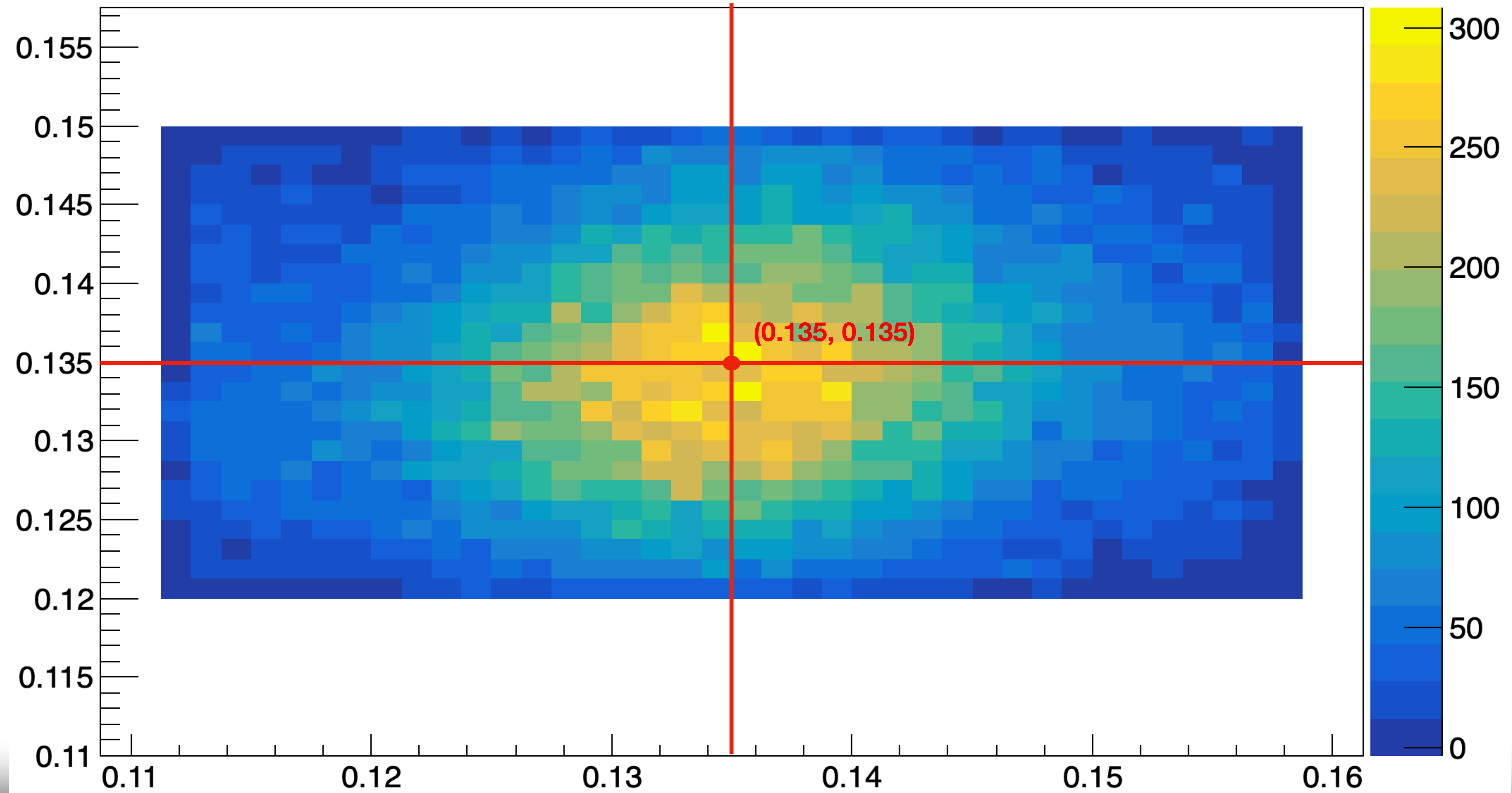
BCAL Energy



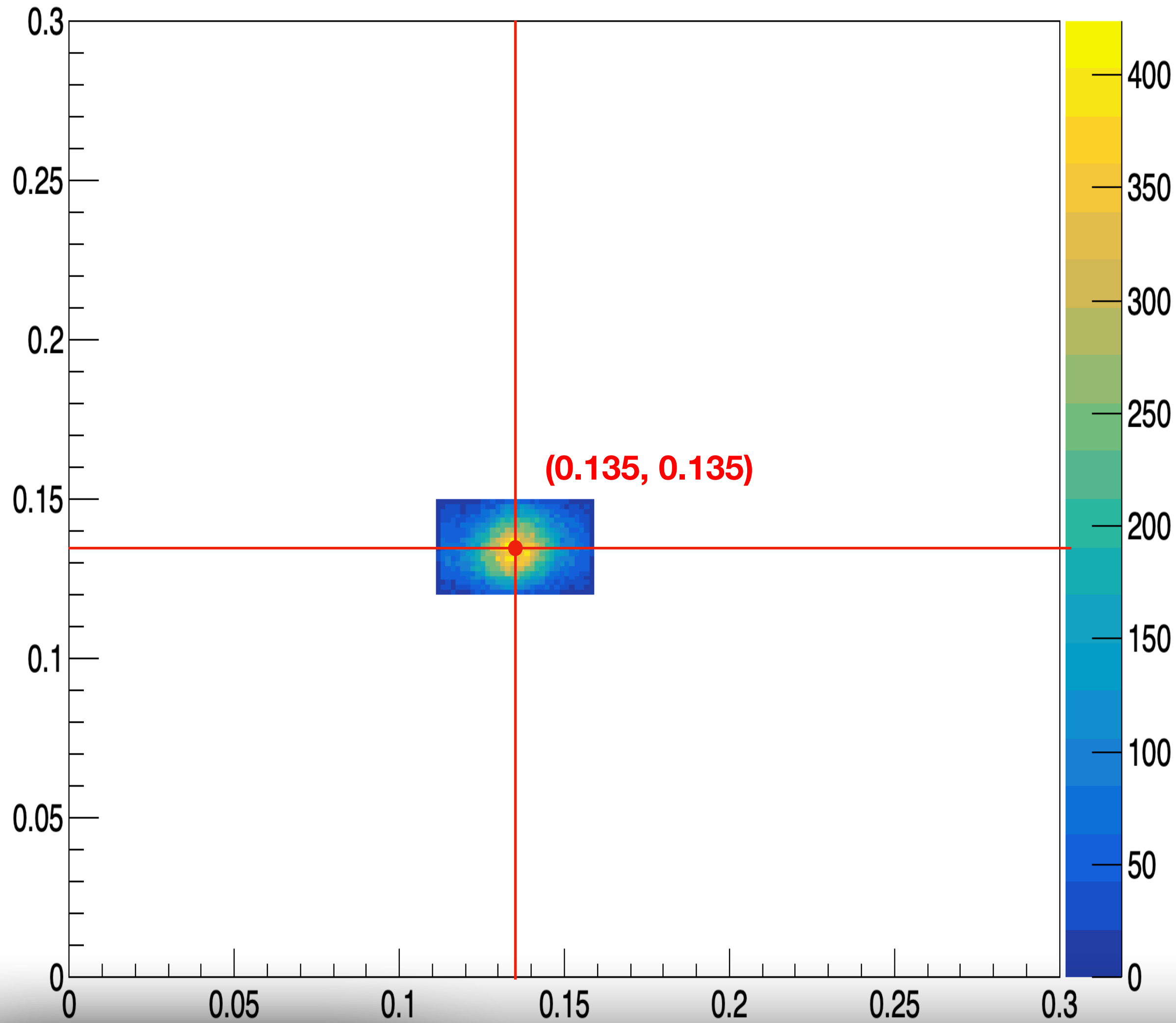
$\gamma p \rightarrow \pi^0 \pi^0(p)$ Reaction Filter, GlueX 2017 – 01 data



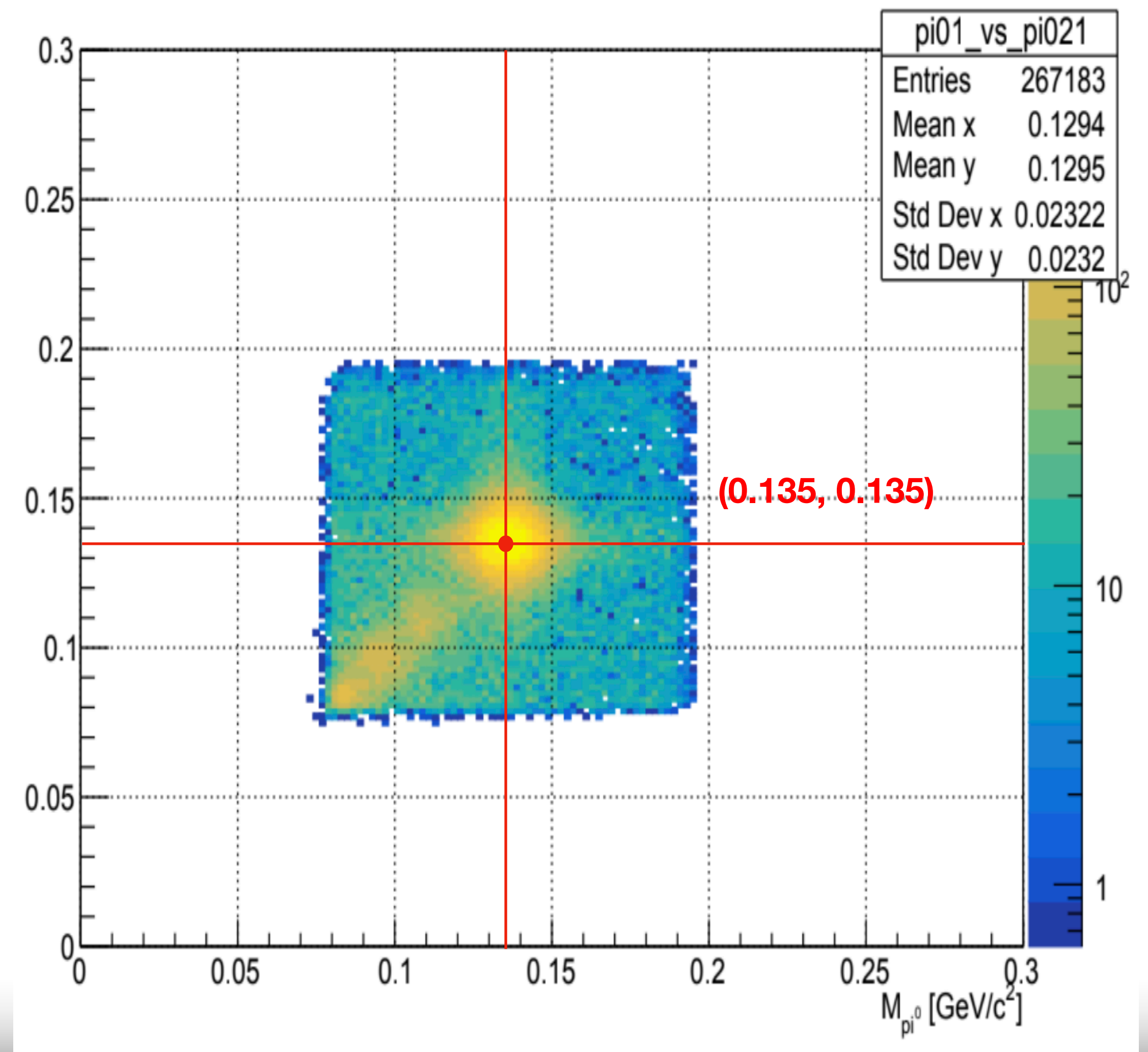
$\gamma p \rightarrow \pi^0 \pi^0(p)$ Reaction Filter, GlueX 2017 – 01 data
 π^0 VS π^0



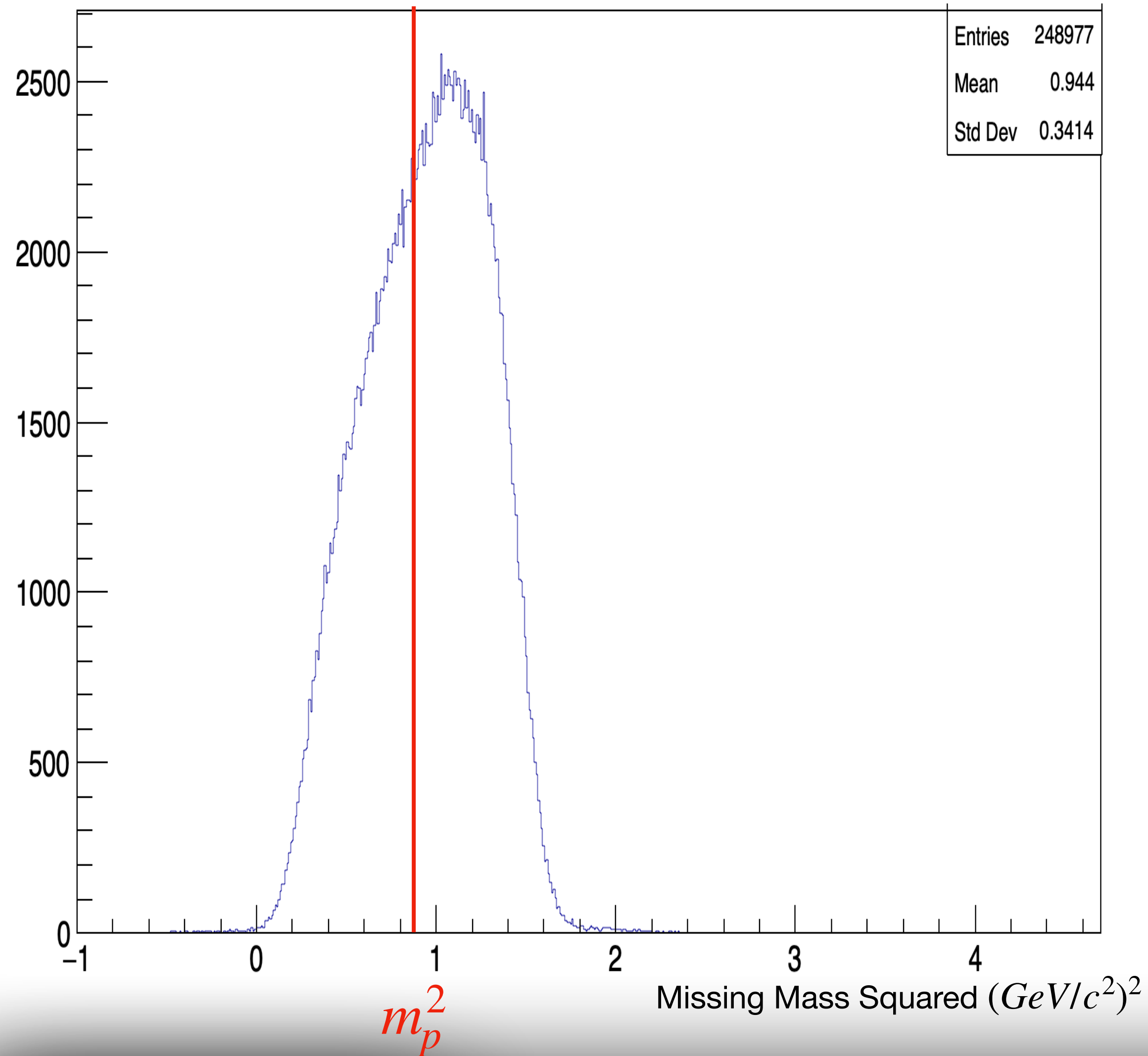
π^0 VS π^0



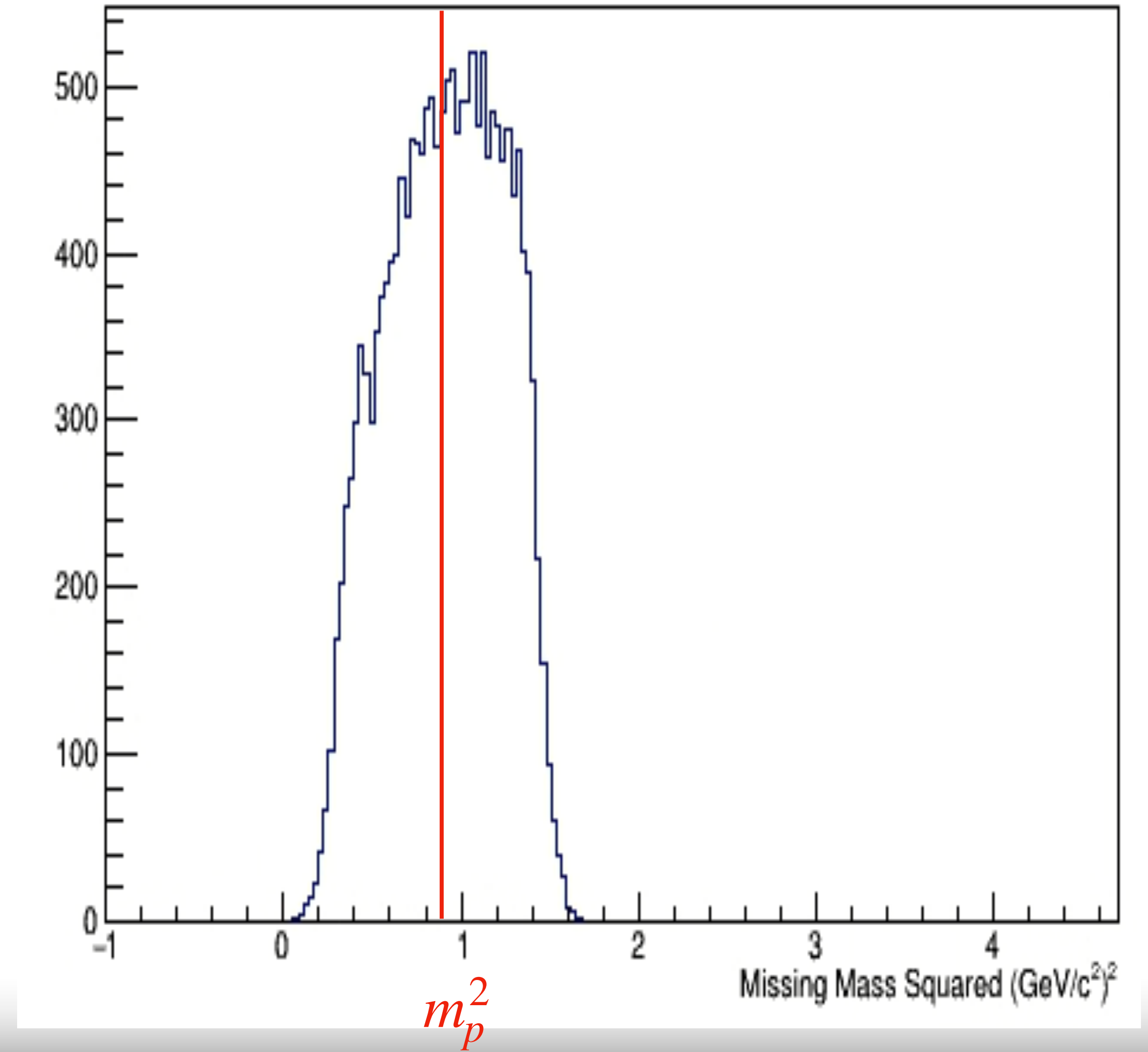
π^0 VS π^0



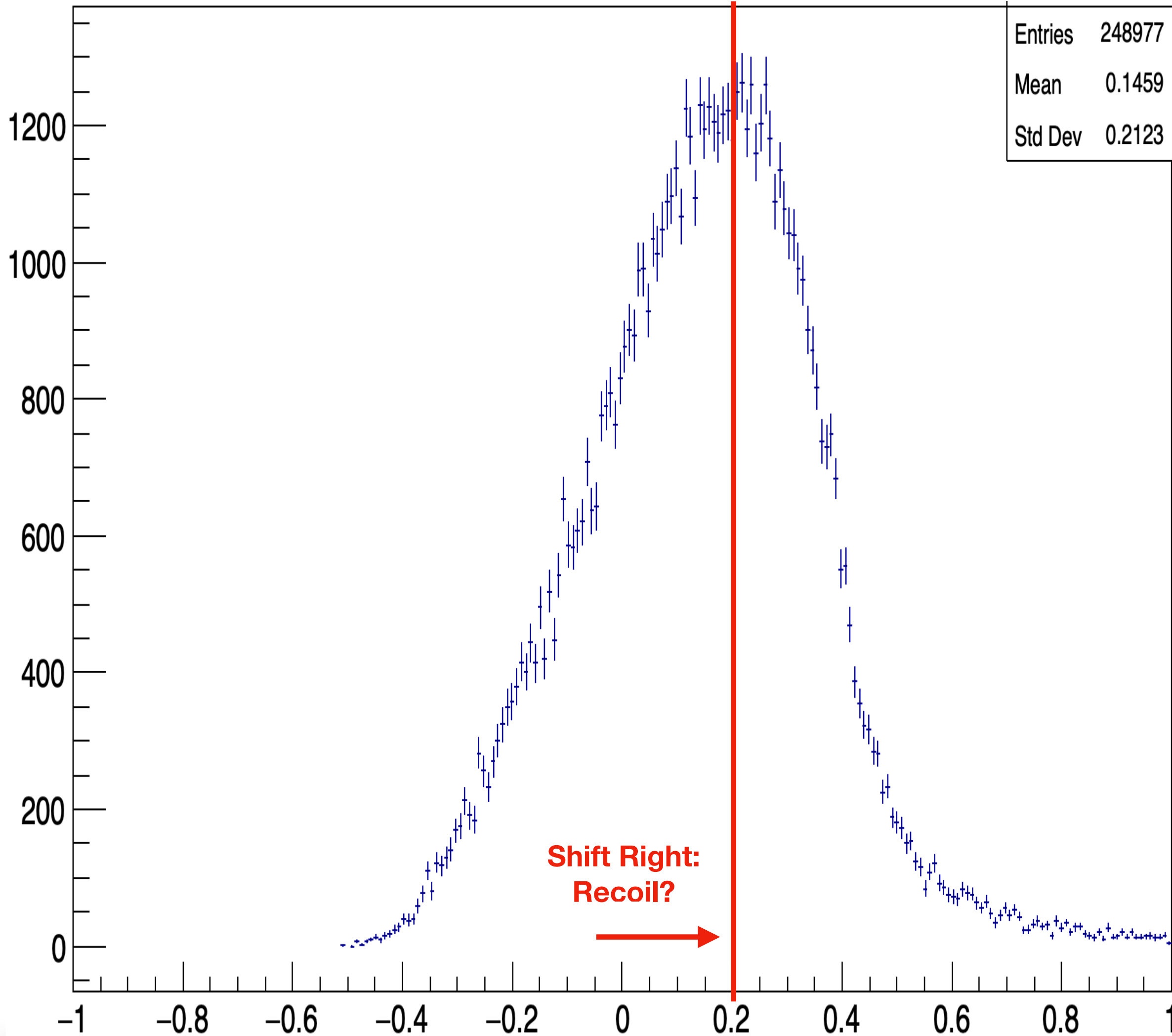
$\gamma p \rightarrow \pi^0 \pi^0(p)$ Reaction Filter, GlueX 2017 – 01 data
Missing Mass Squared



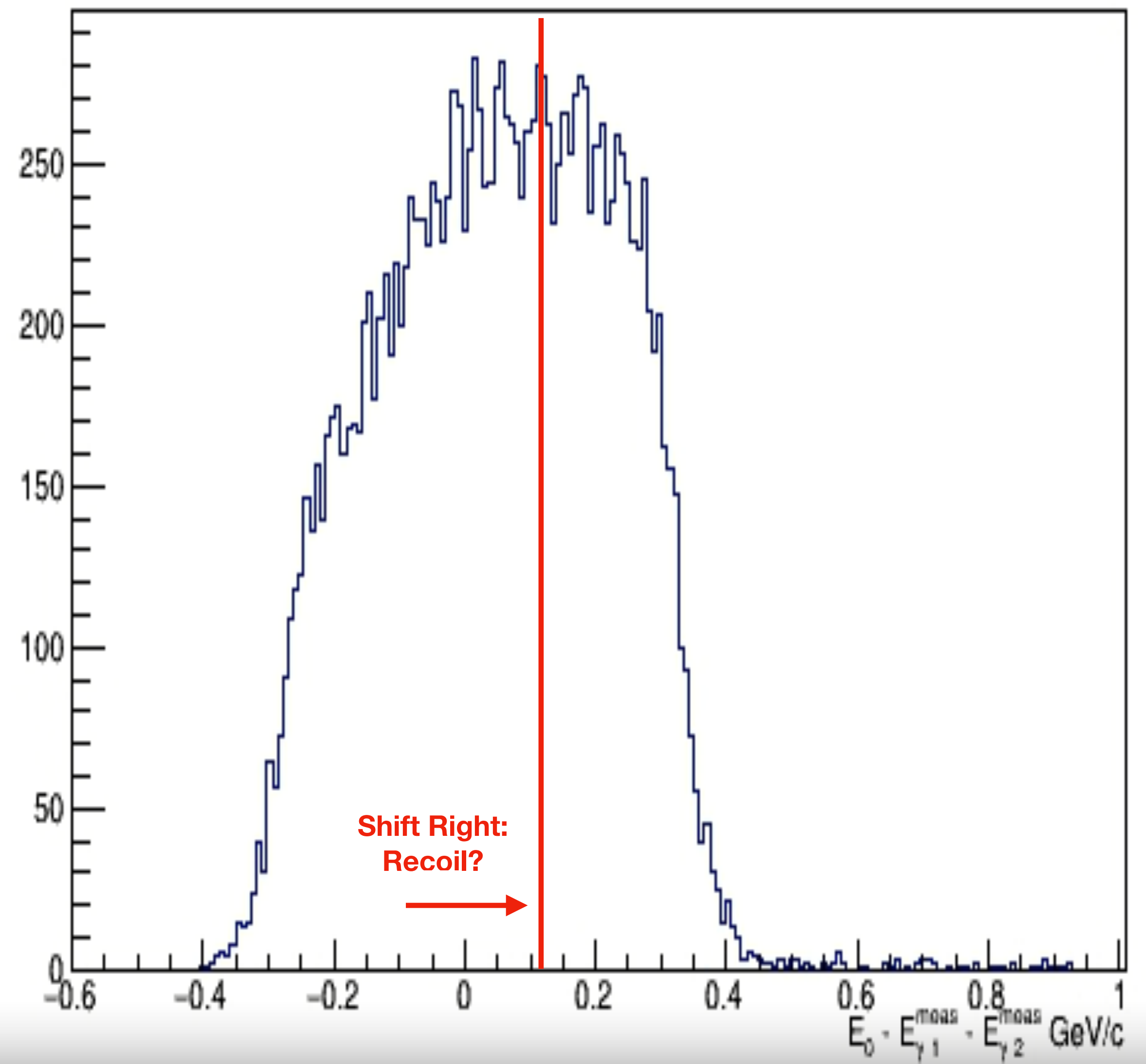
Simulated $\pi^0 \gamma p \rightarrow \pi^0(p)$
Missing Mass Squared



Missing Energy

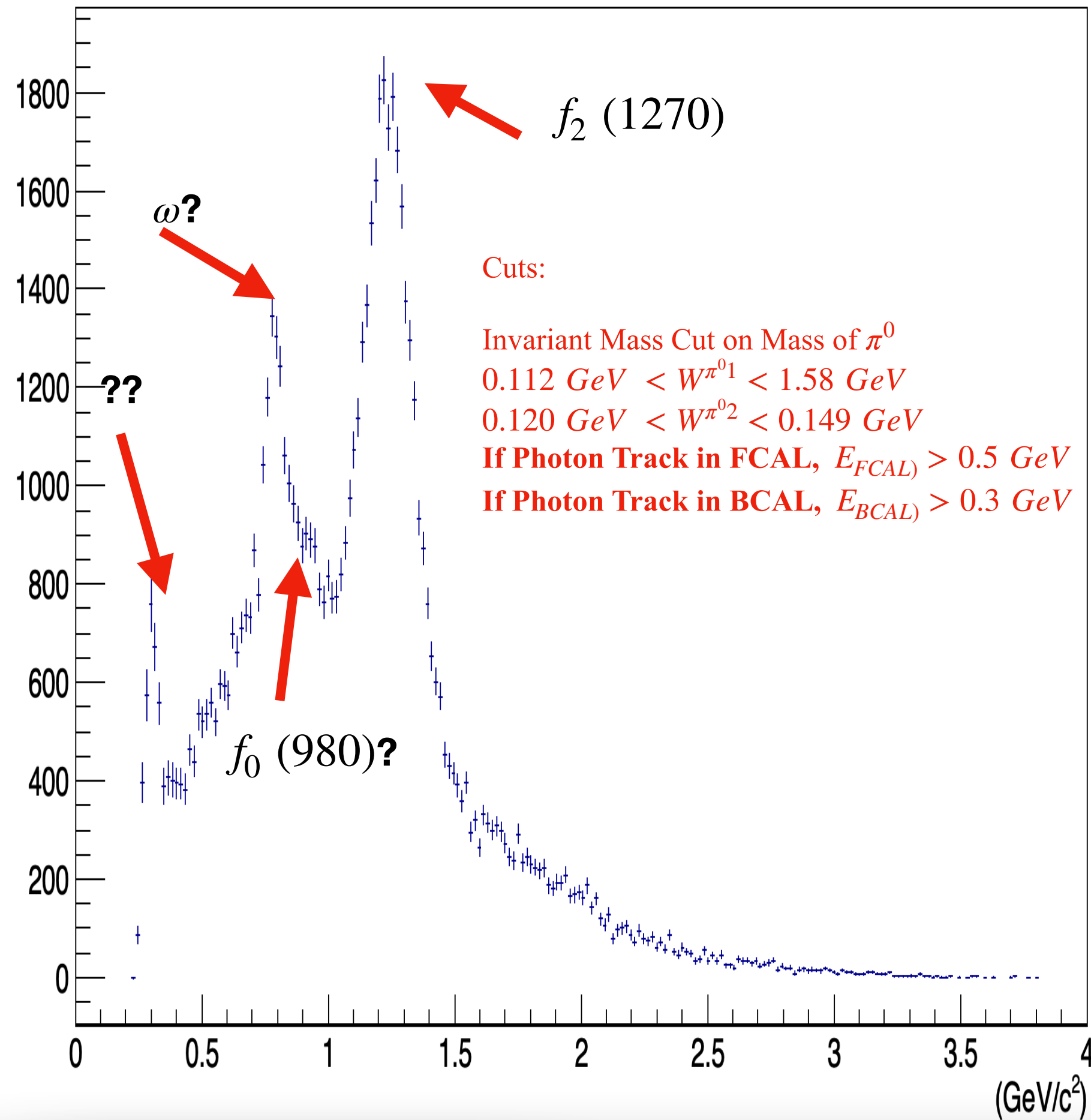


Missing Energy

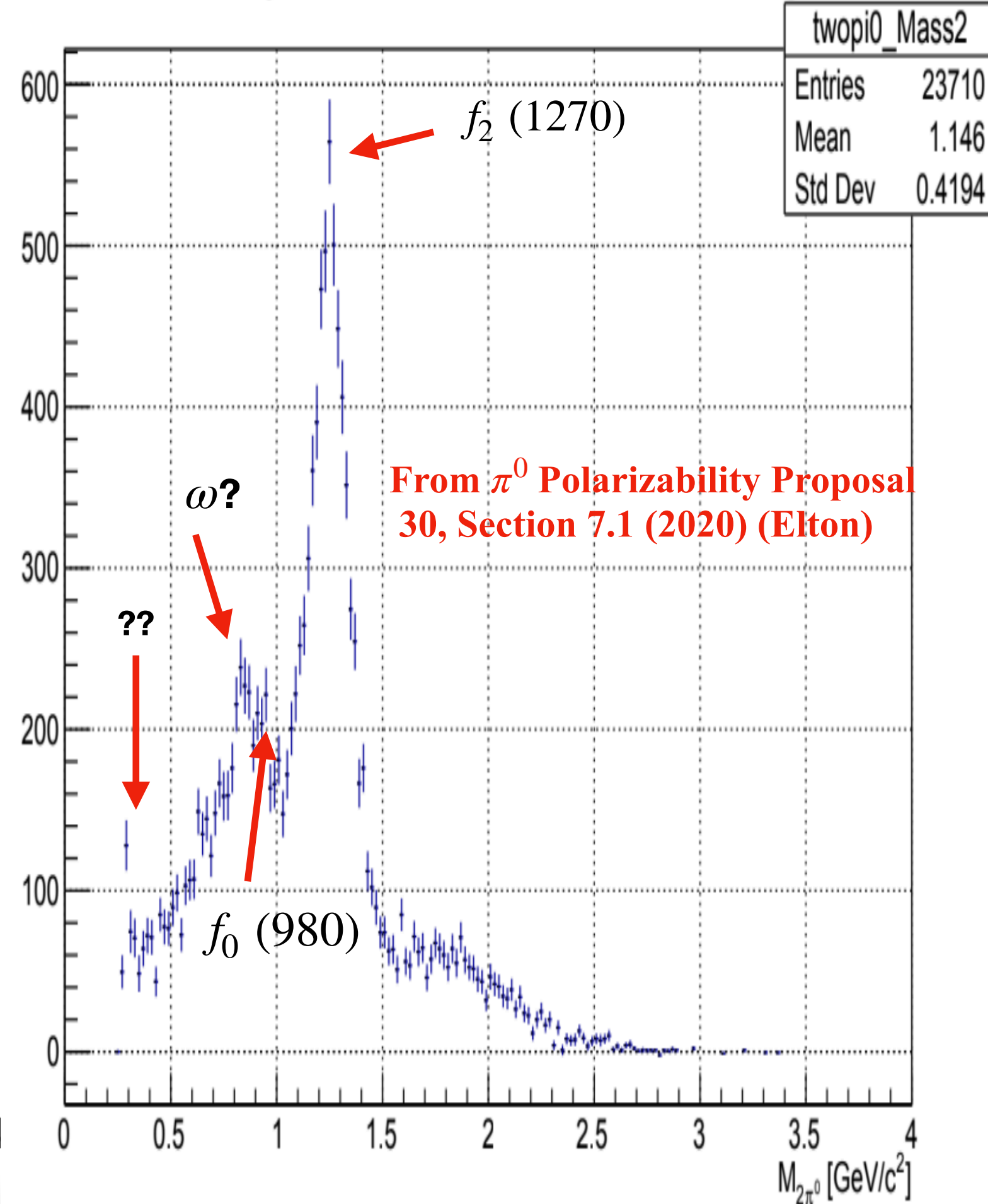


$\gamma p \rightarrow \pi^0 \pi^0(p)$ Reaction Filter, GlueX 2017 – 01 data

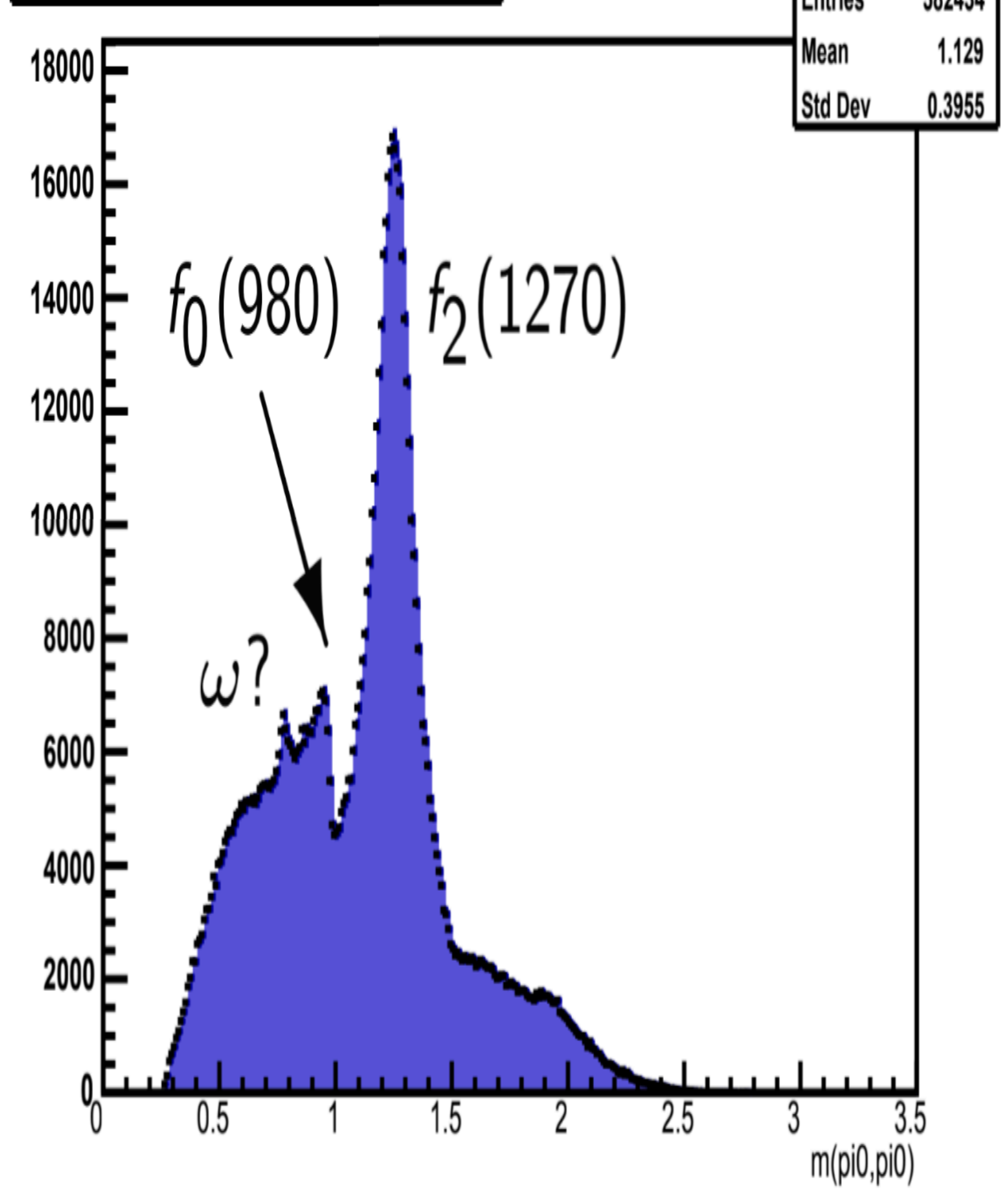
$\pi^0 \pi^0$ Invariant Mass



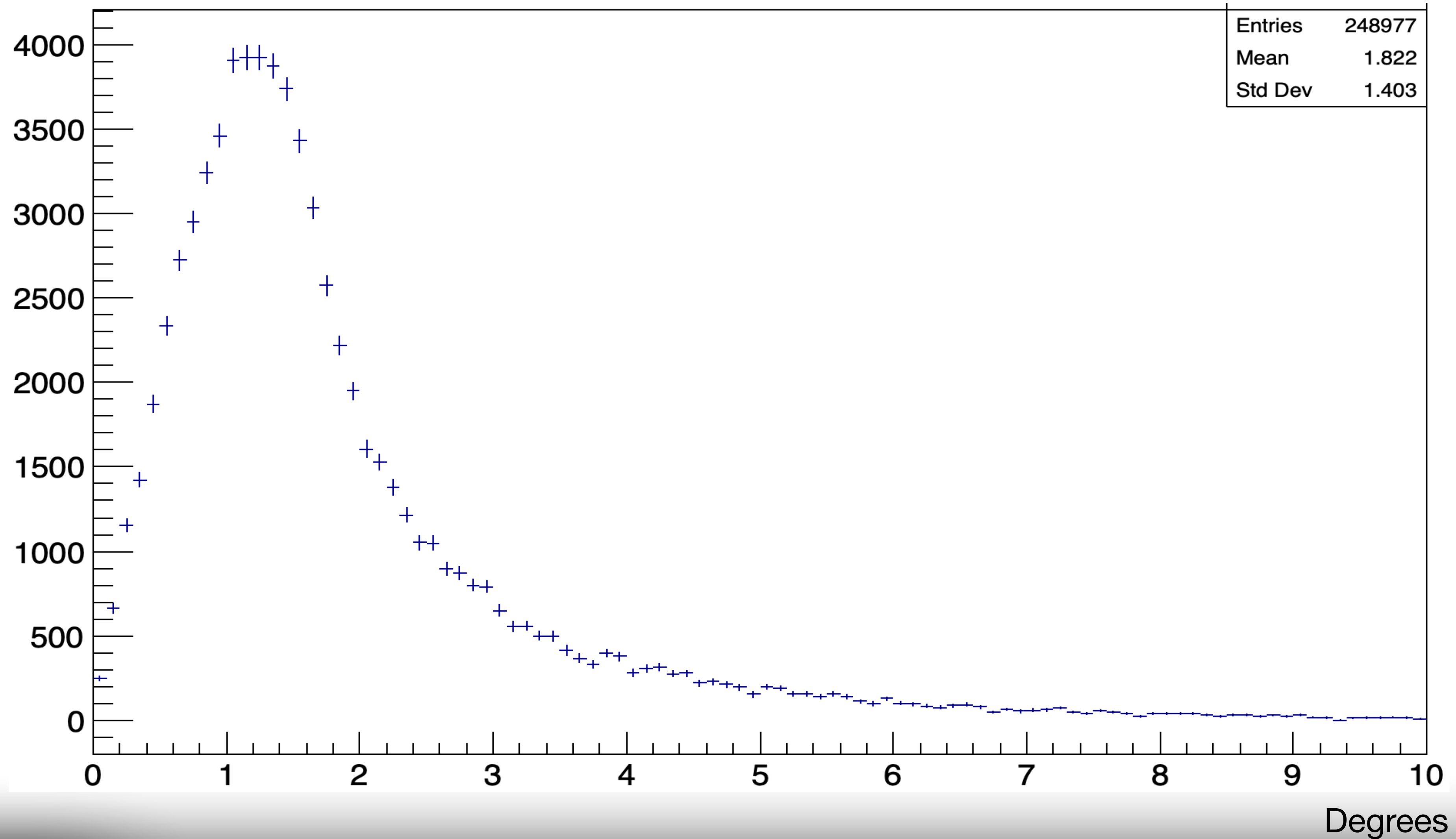
$2-\pi^0$ System Invariant Mass at $\theta < 1\text{deg.}$



invariant mass ($0.01 < t < 0.21$)

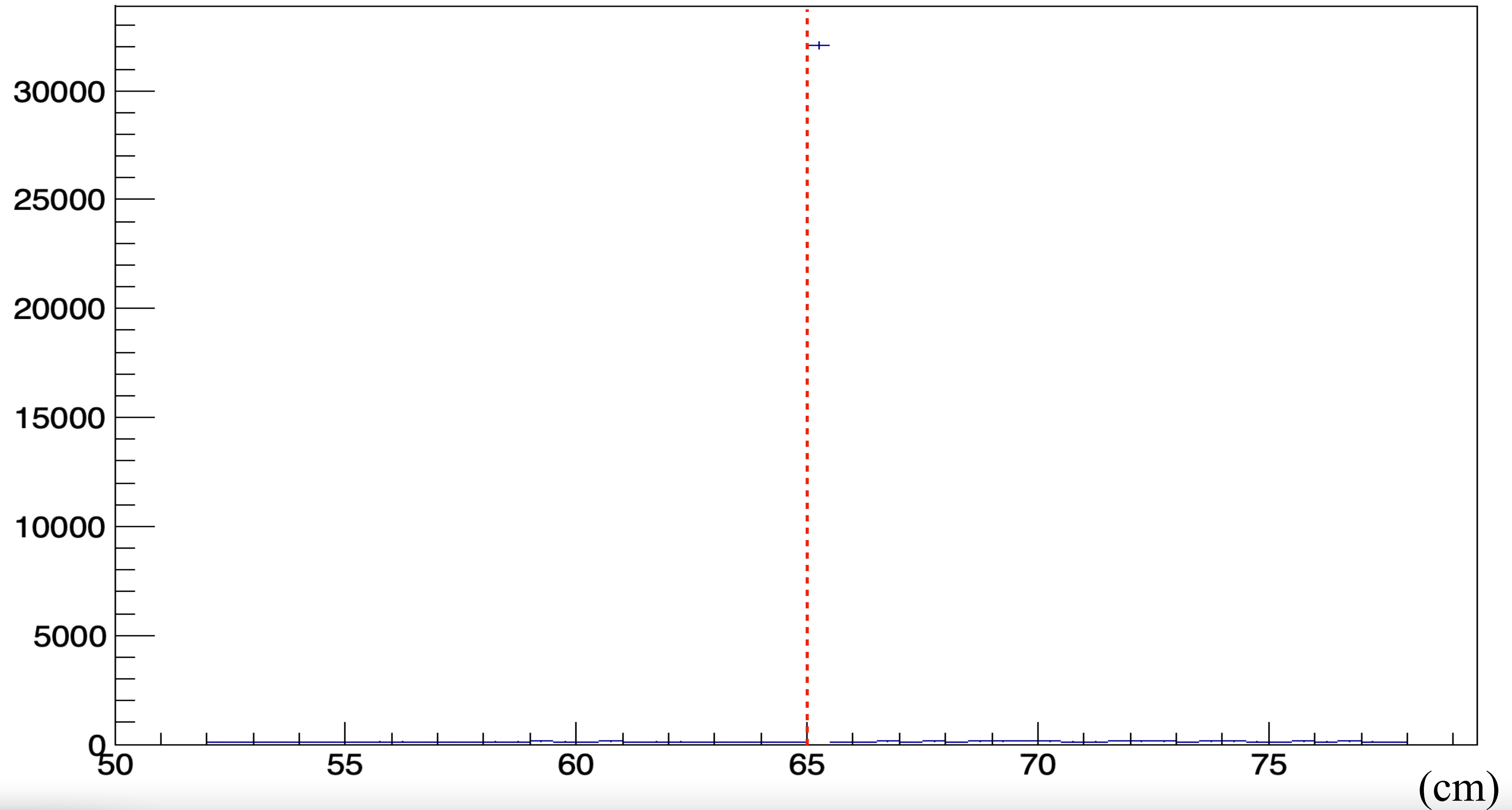


$\gamma p \rightarrow \pi^0 \pi^0 (p)$ Reaction Filter, GlueX 2017 – 01 data
 $\pi^0 \pi^0 \theta$

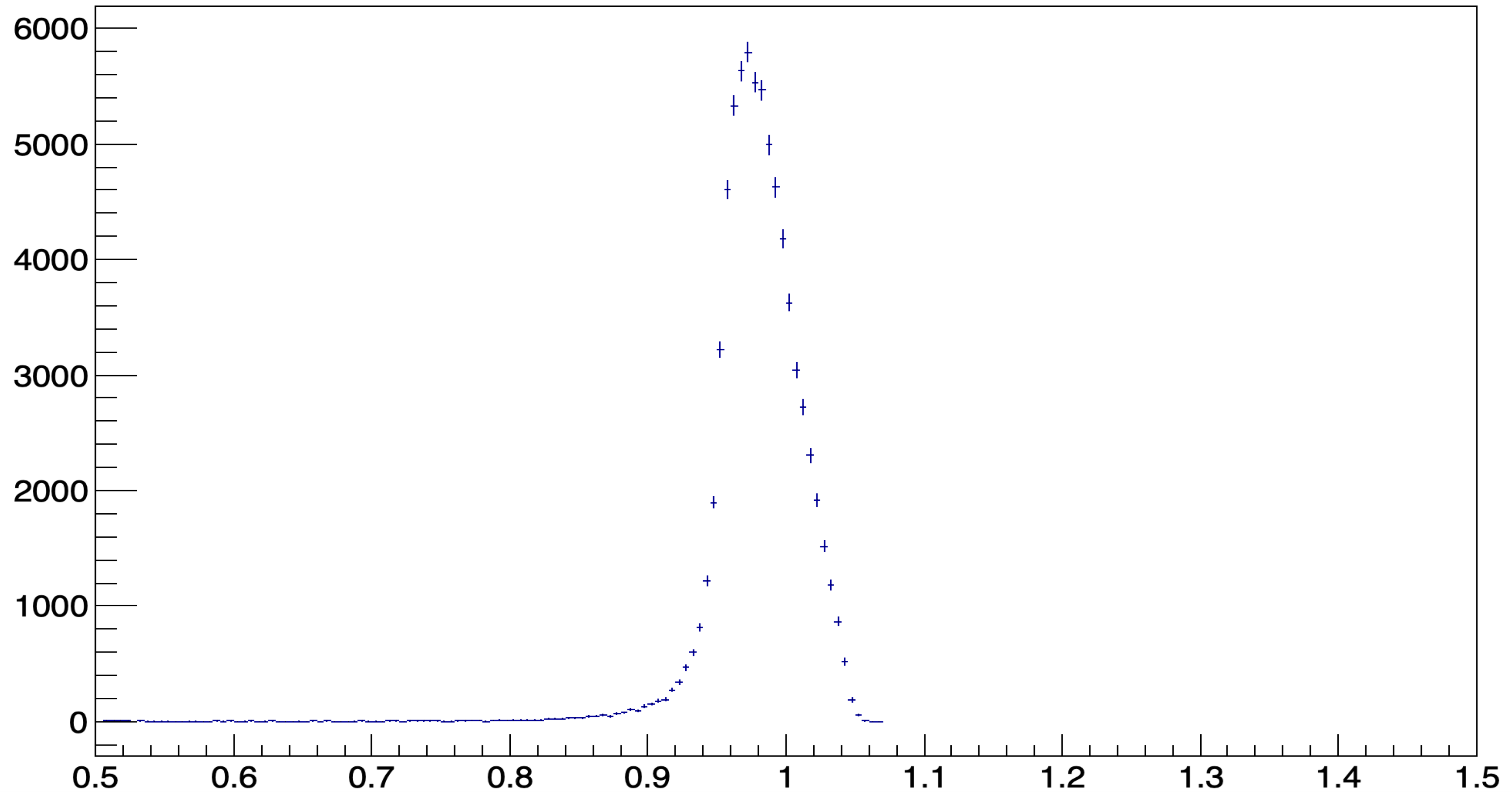


Other Slides

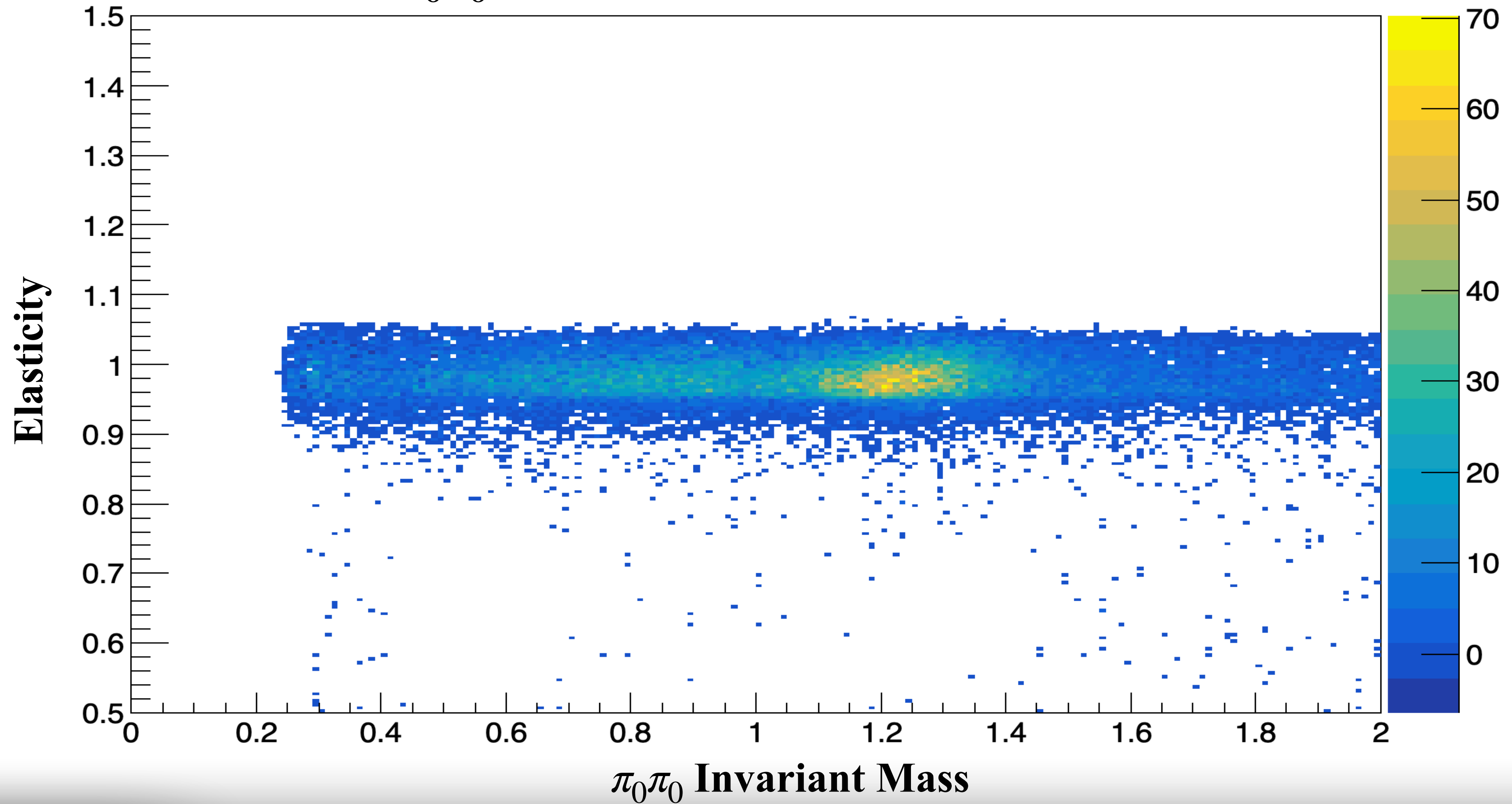
Vertex Position



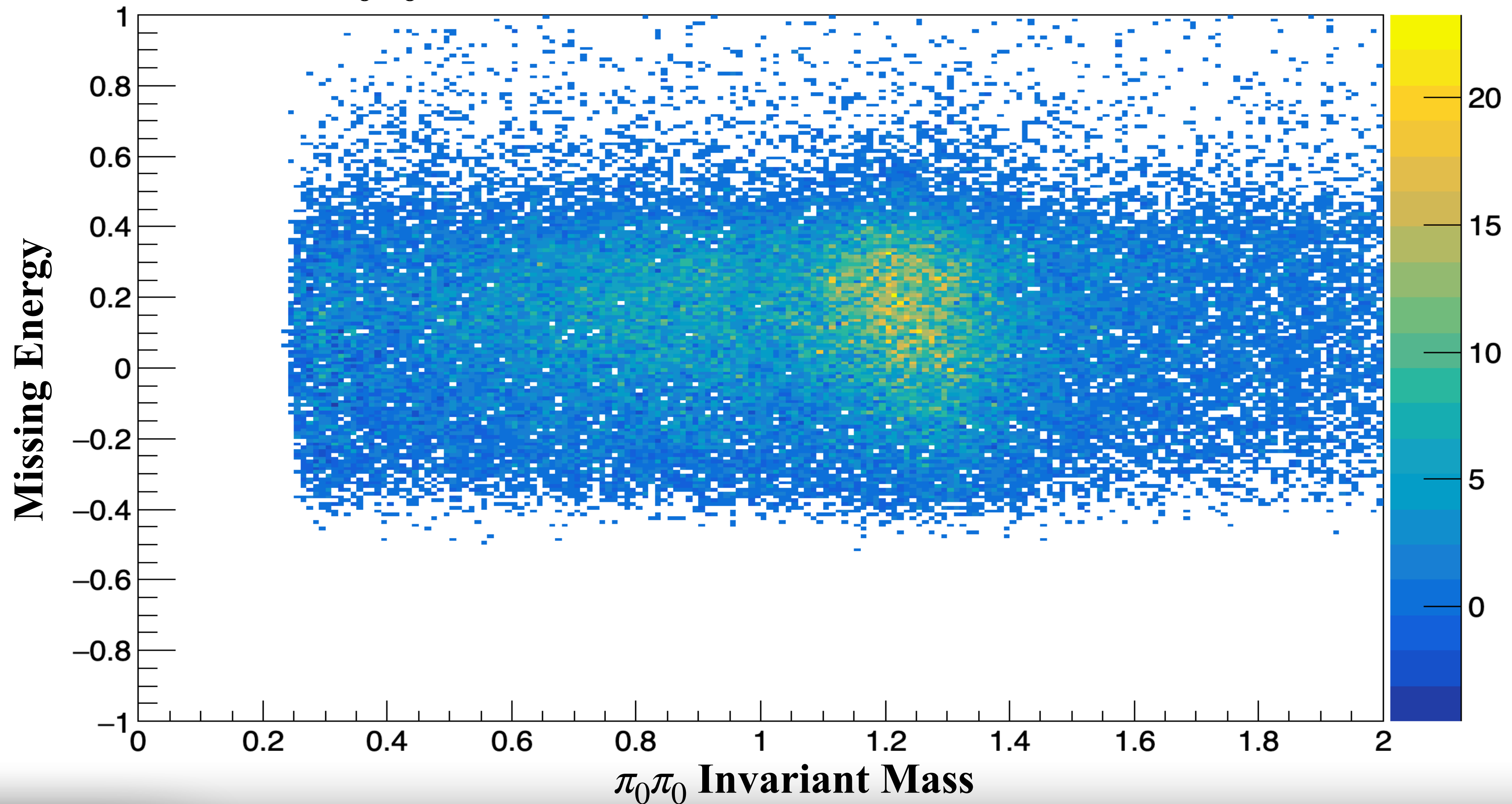
$\pi_0\pi_0$ Elasticity



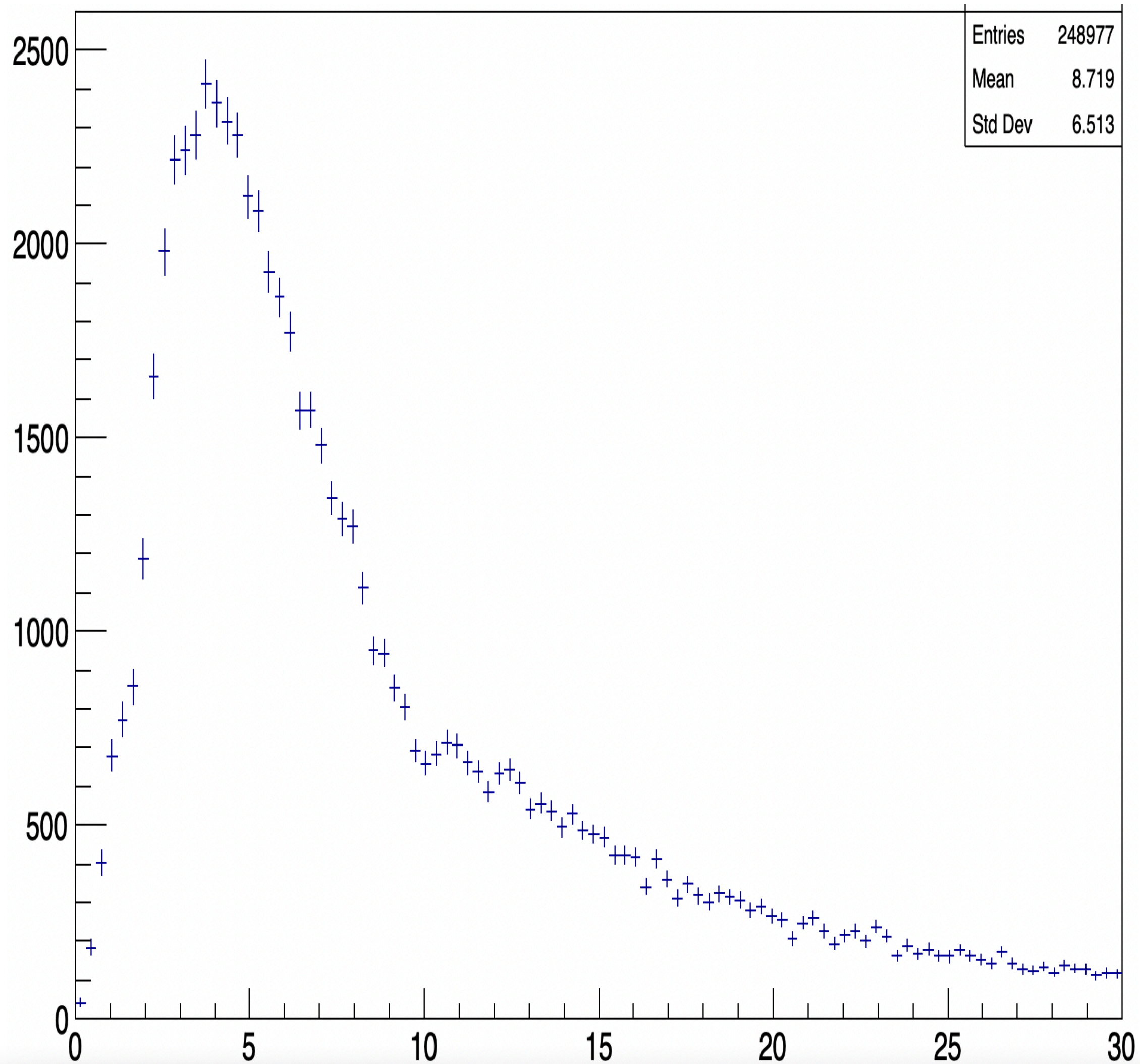
$\pi_0\pi_0$ Invariant Mass VS Elasticity



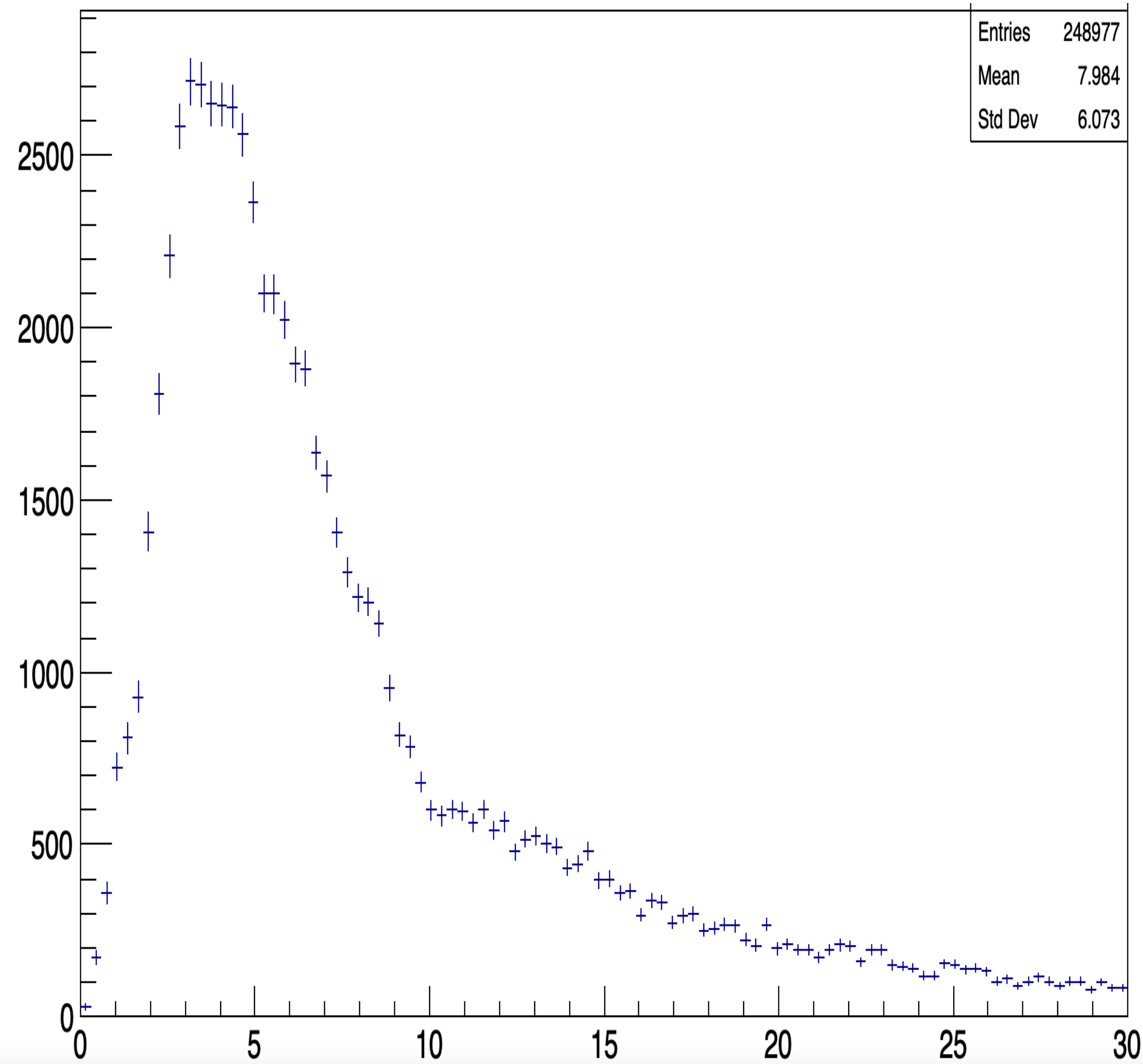
$\pi_0\pi_0$ Invariant Mass VS Missing Energy



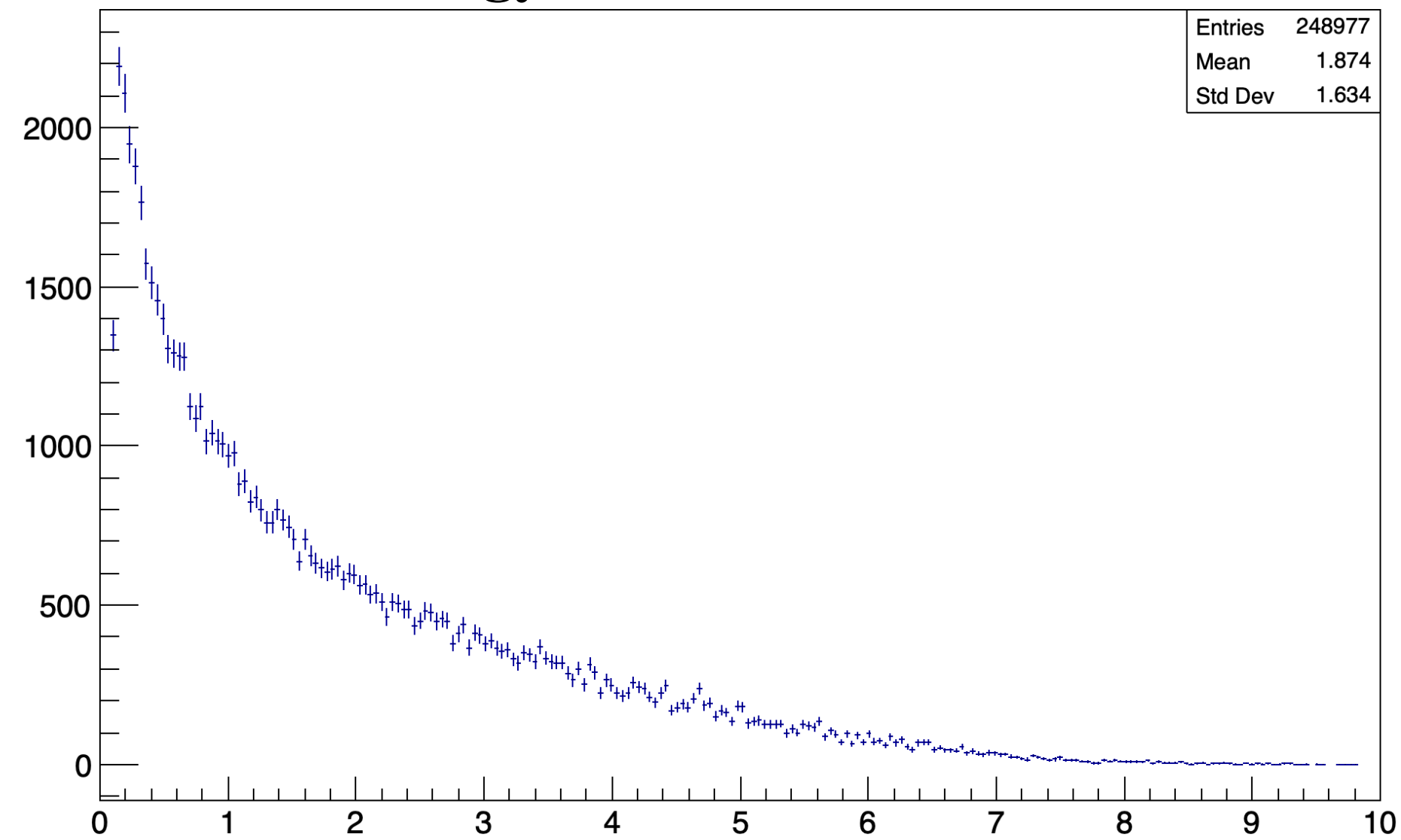
π_0 1 Theta



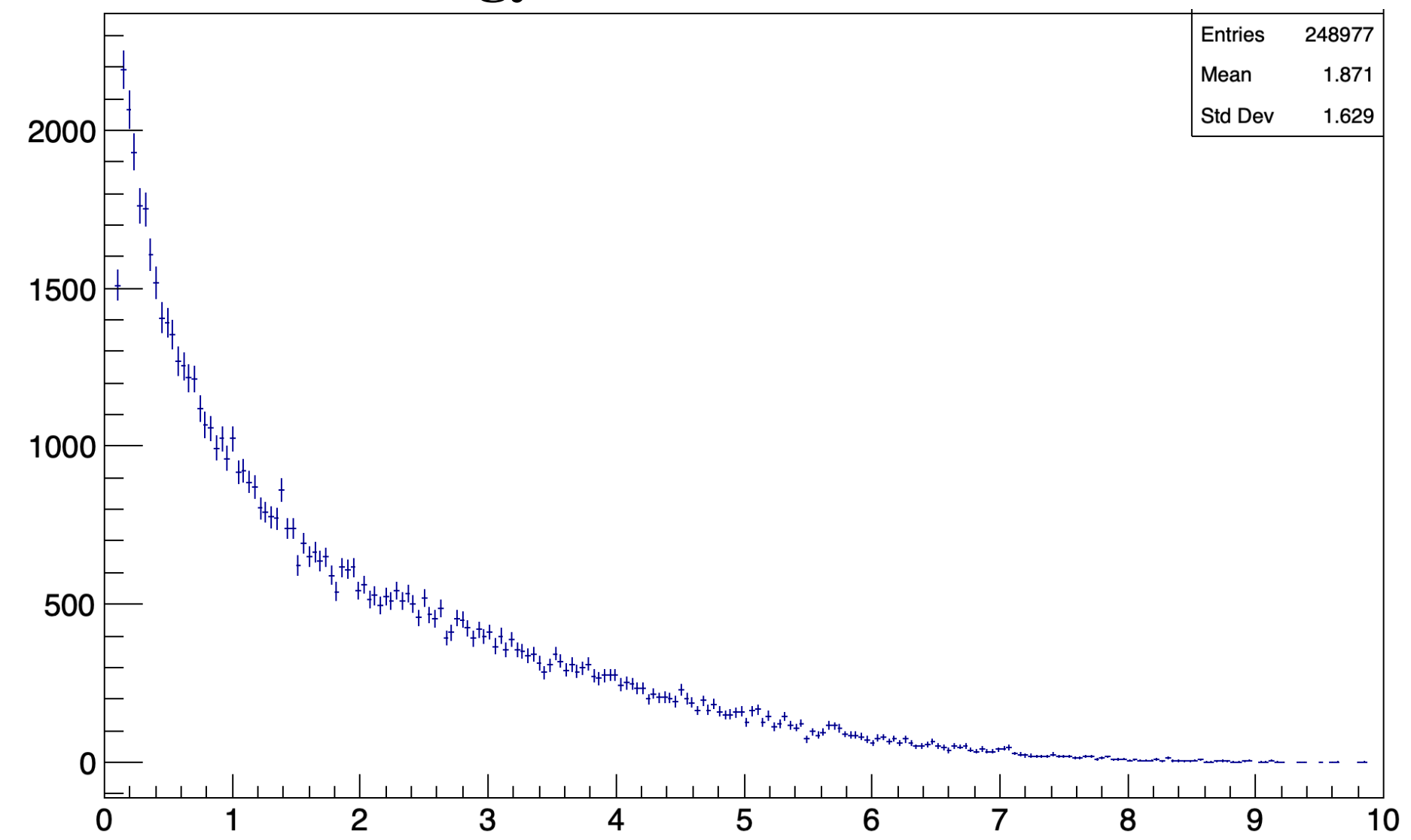
π_0 2 Theta



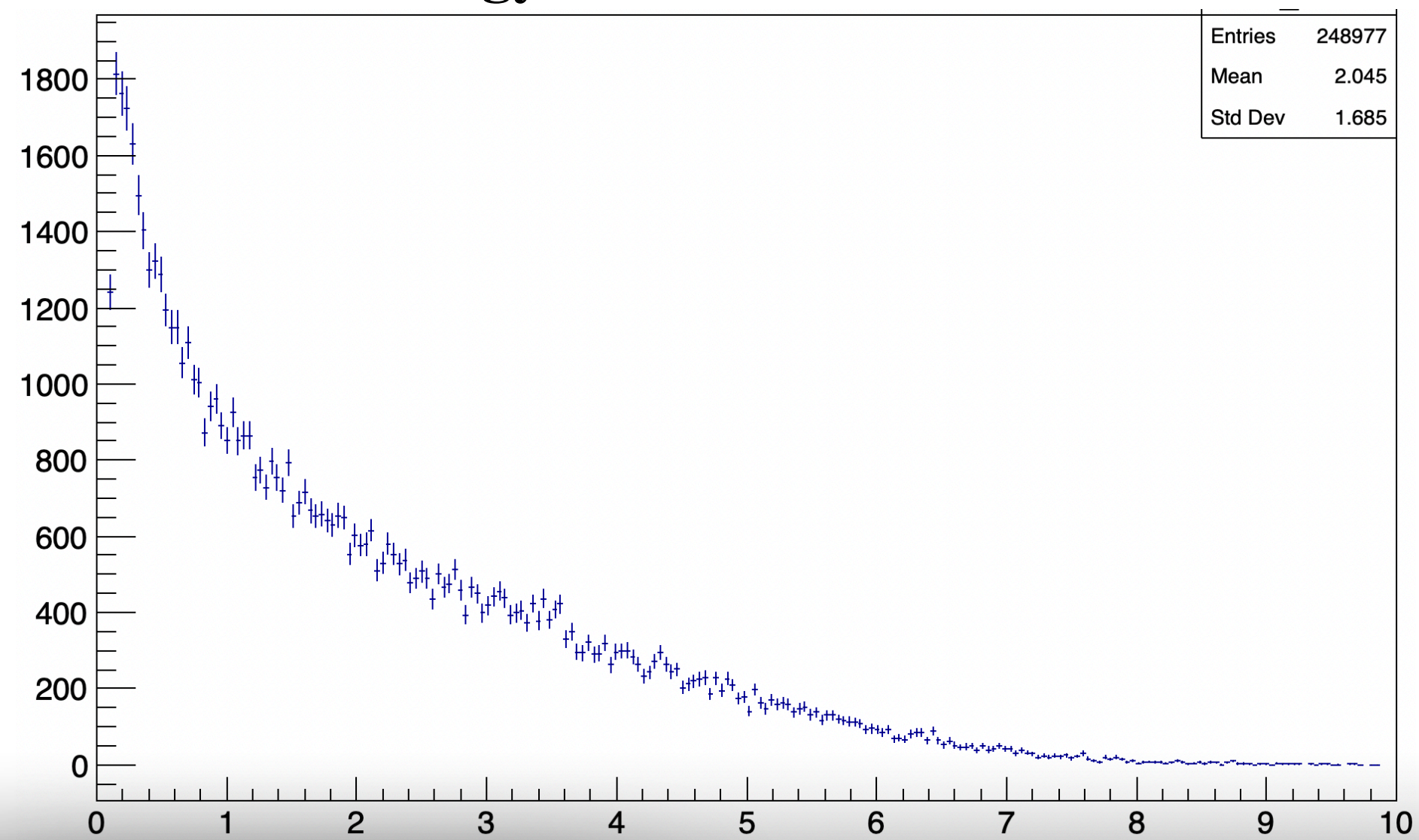
Photon 1 Energy



Photon 2 Energy



Photon 3 Energy



Photon 4 Energy

