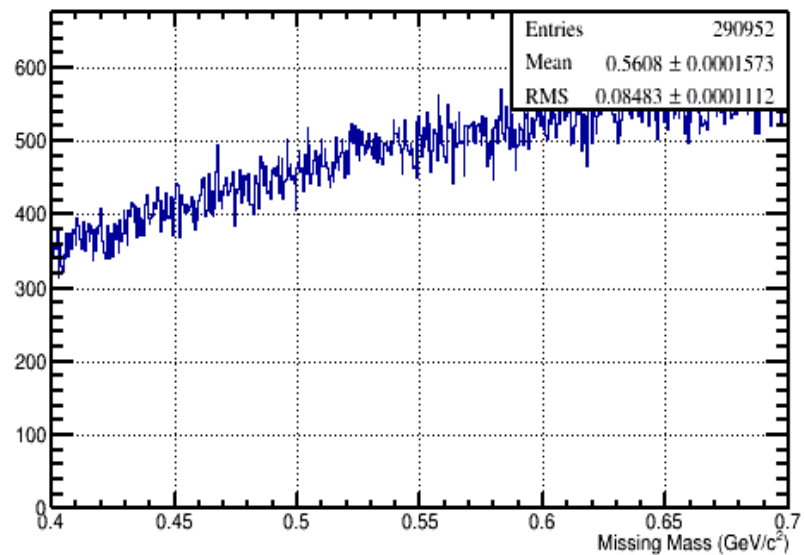


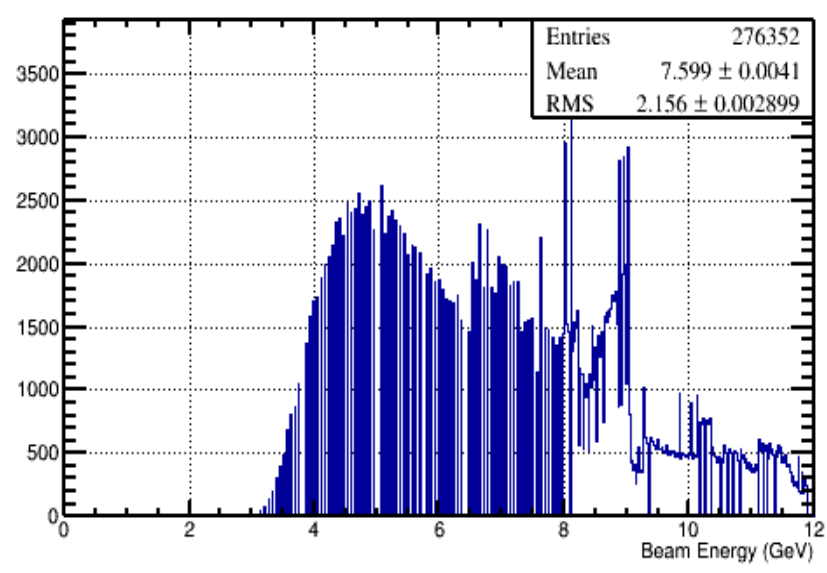
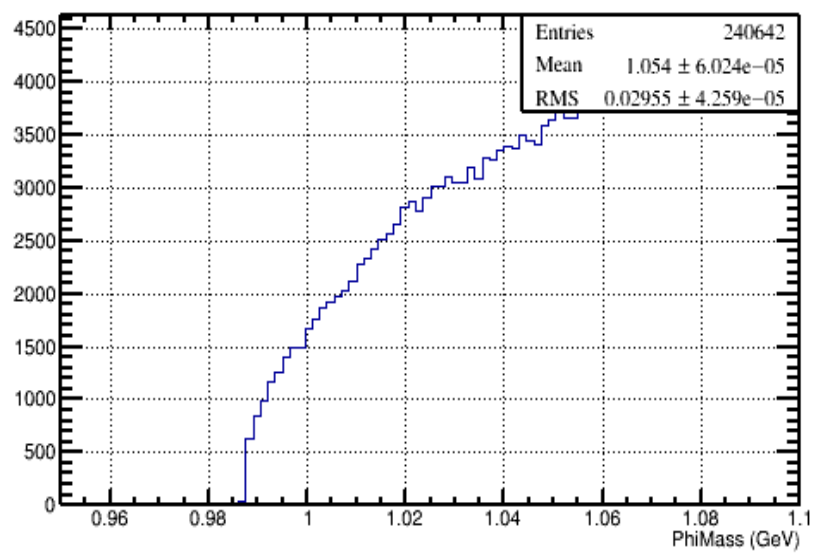
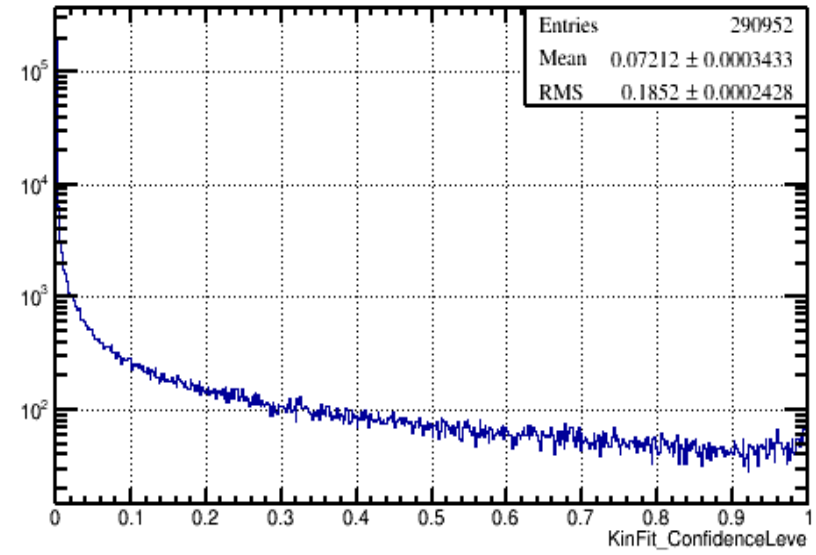
Study of $\gamma p \rightarrow p \varphi(\eta)$

- Purpose: Investigate the acceptance effects of a missing eta meson at GlueX.
- Basic Cuts: PhiMass [0.95-1.1] GeV, MissingMass [0.4,0.7], Kinematic Fit must converge (0.0), dEdX of Proton and Kaons, 2 ns timing cut for all particles in all timing detectors.
- Run 11447 (perp)

MM Phi_Mass

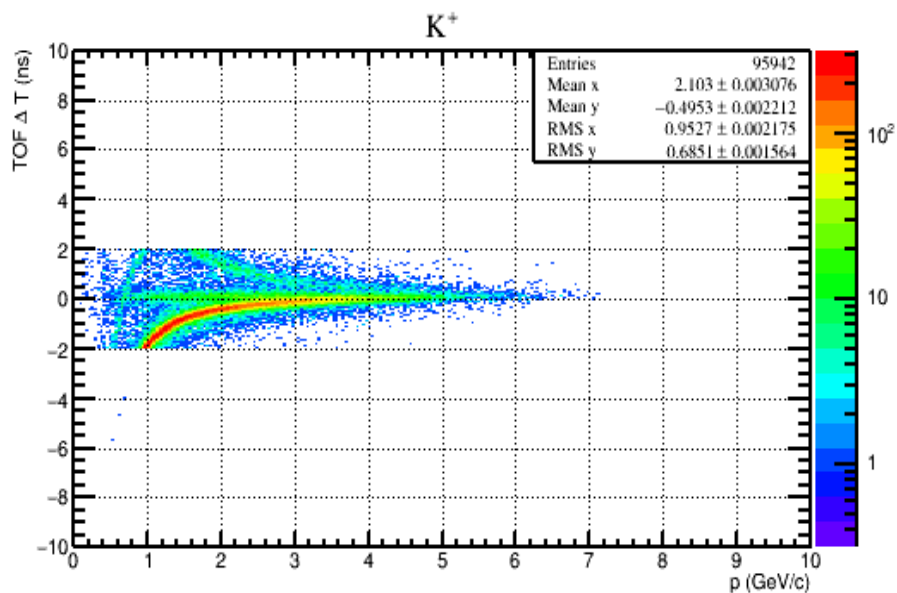


KinFit Beam_E



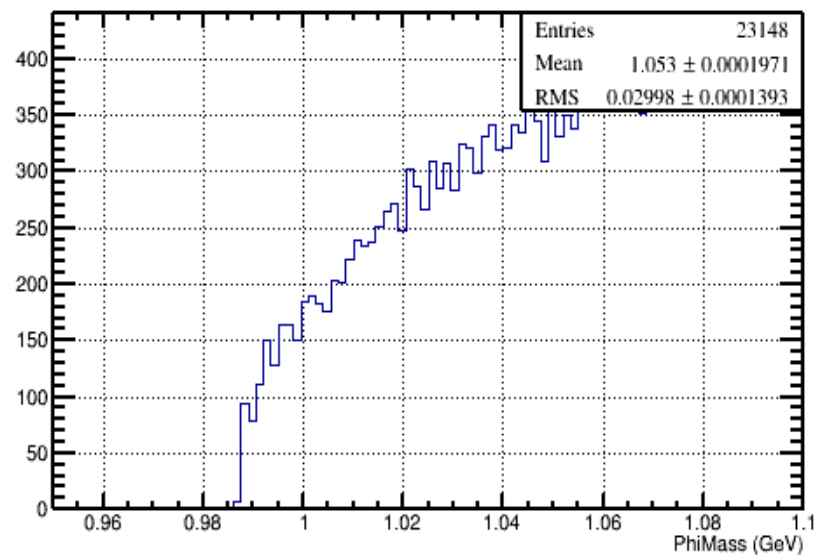
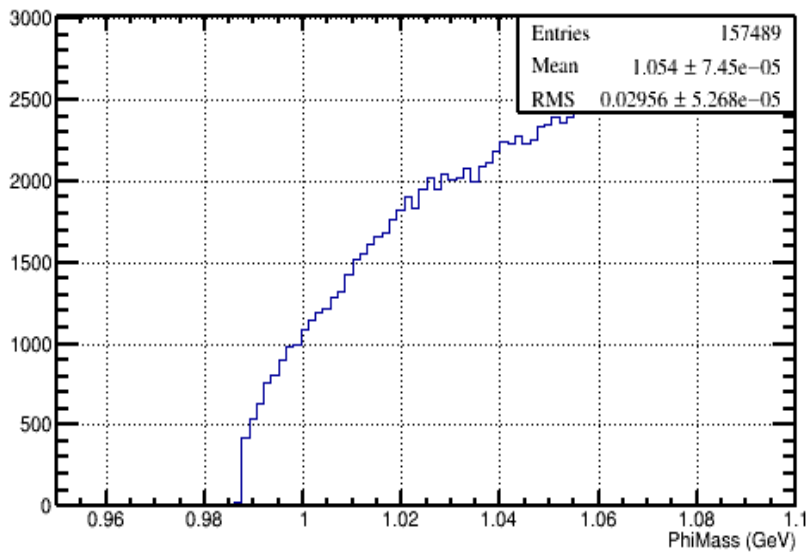
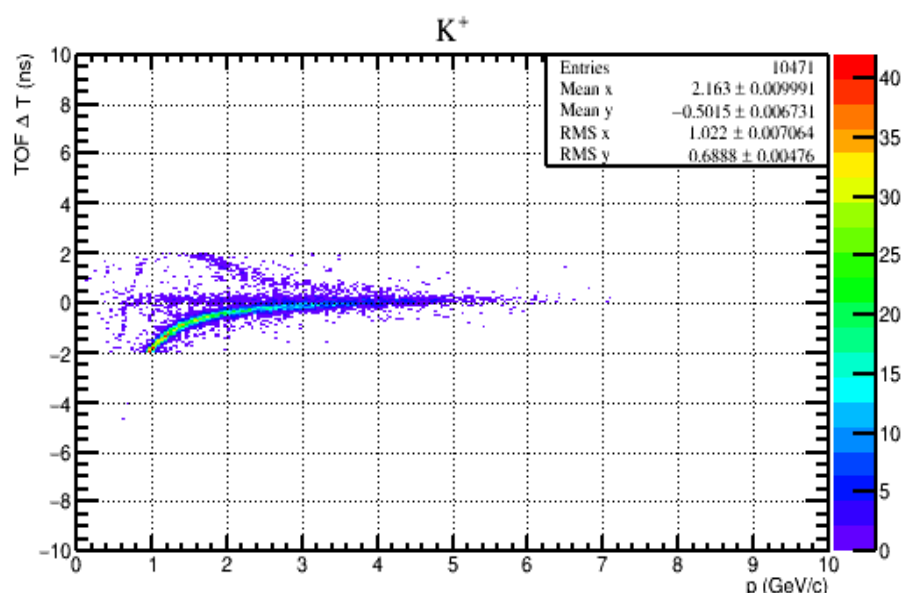
K+ dT (no cut)

K+K- Inv.M (no cut)



K+ dT (20% cut)

K+K- Inv.M (10% & Kaon Pid cut)

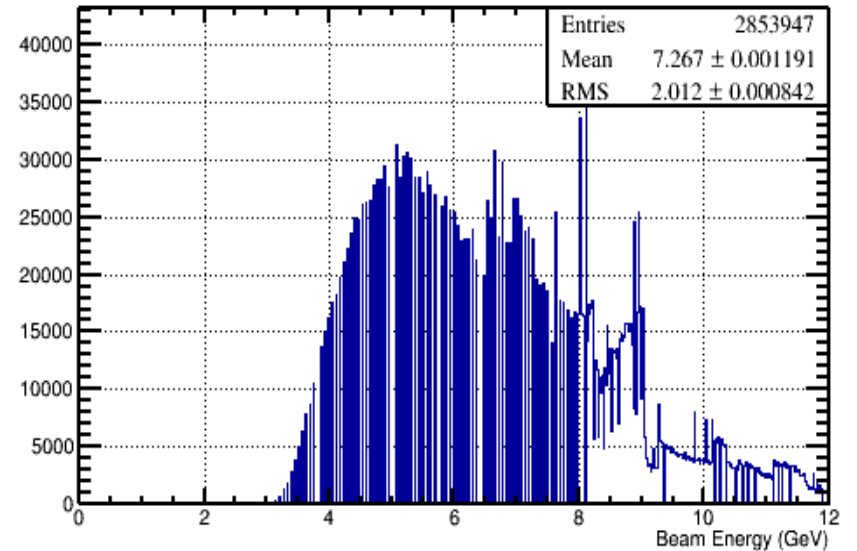
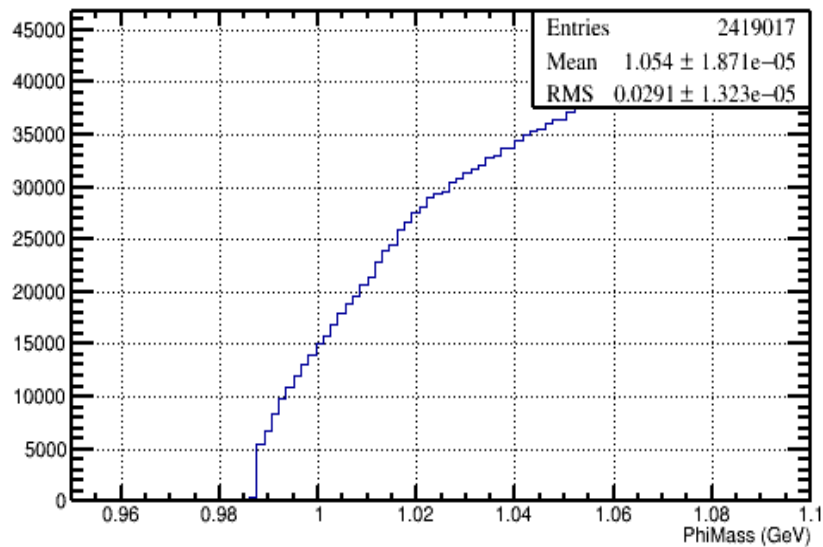
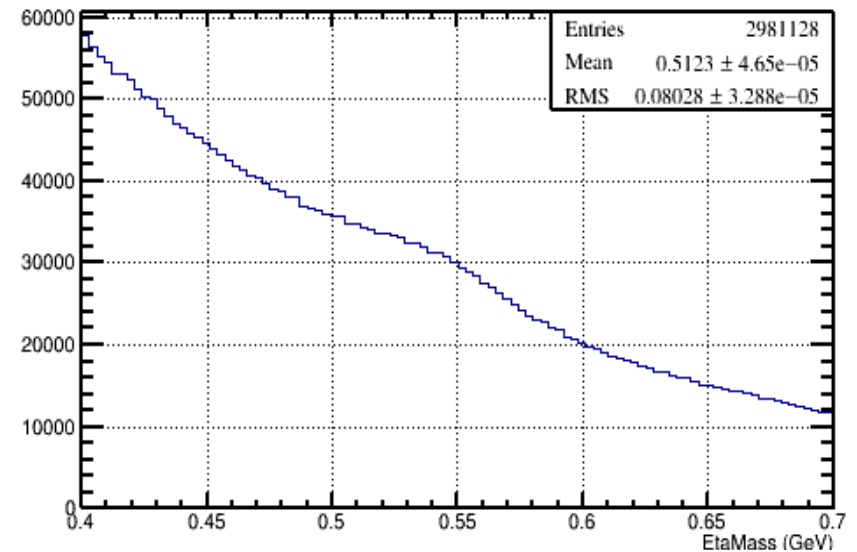
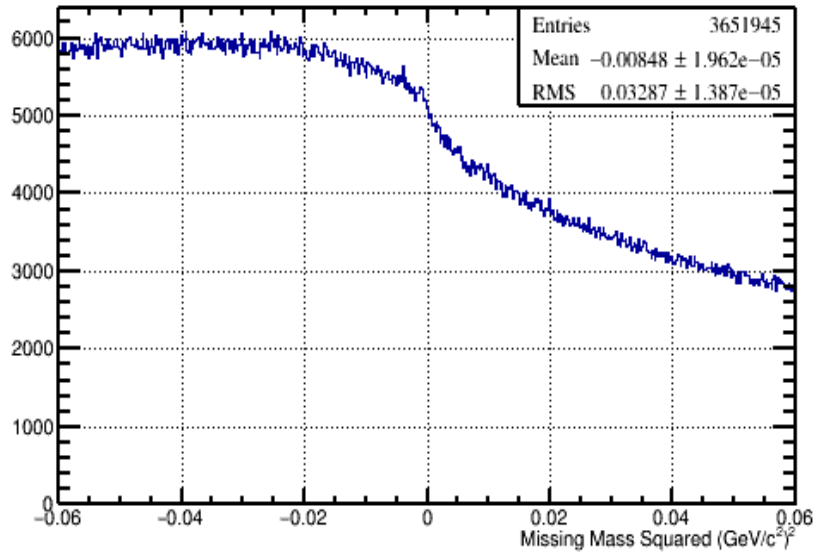


Study of $\gamma p \rightarrow p \varphi \eta$

- Purpose: Investigate phi eta at GlueX.
- Basic Cuts: PhiMass [0.95-1.1] GeV, EtaMass [0.4,0.7] GeV, MissingMassSquared [-0.08,0.08], Kinematic Fit must converge (0.0), dEdX of Proton and Kaons, 2 ns timing cut for all particles in all timing detectors.
- Runs 11347-11555 (~20% of all Spring Data)

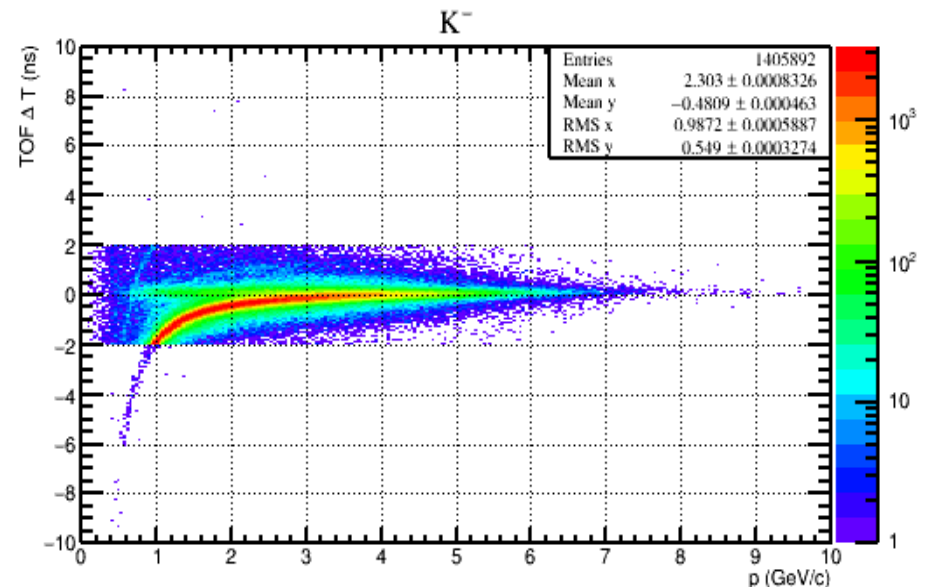
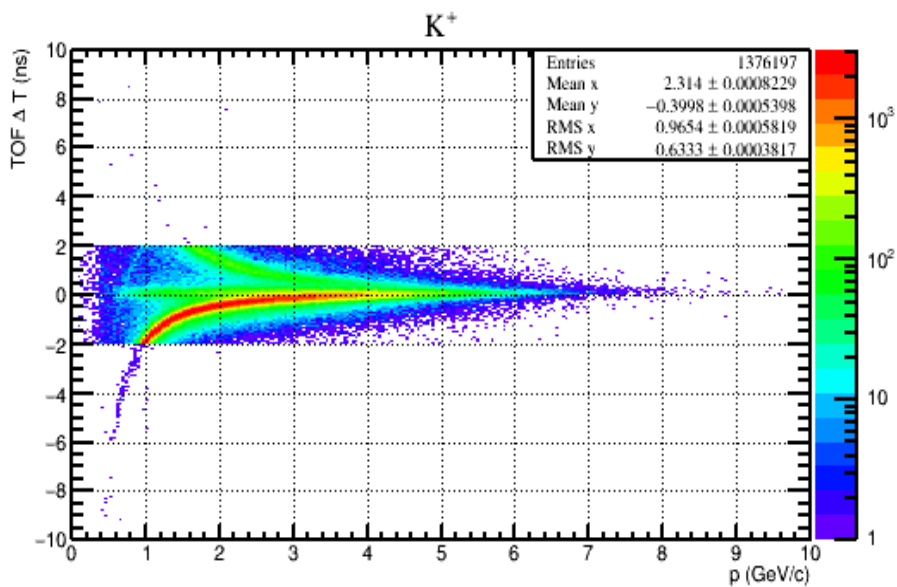
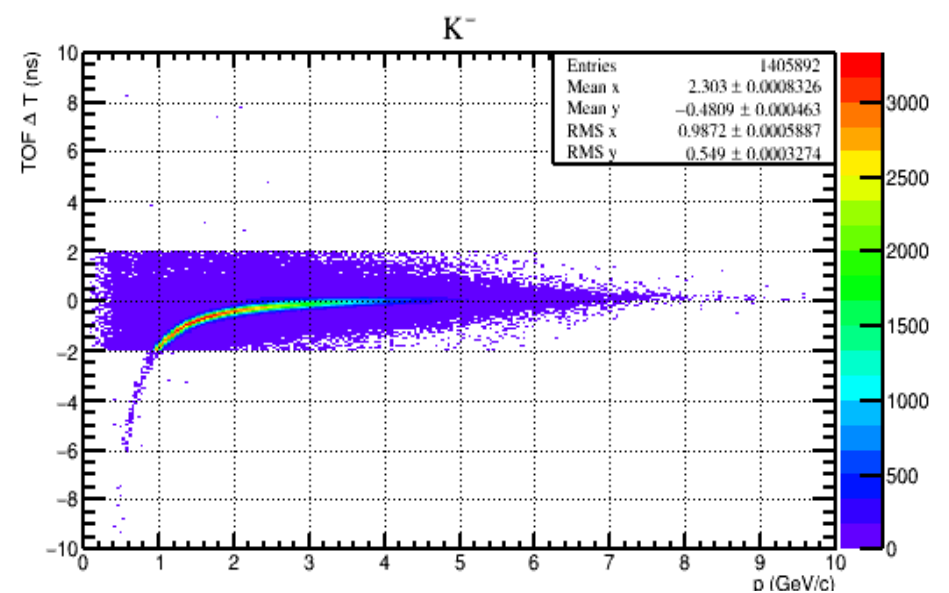
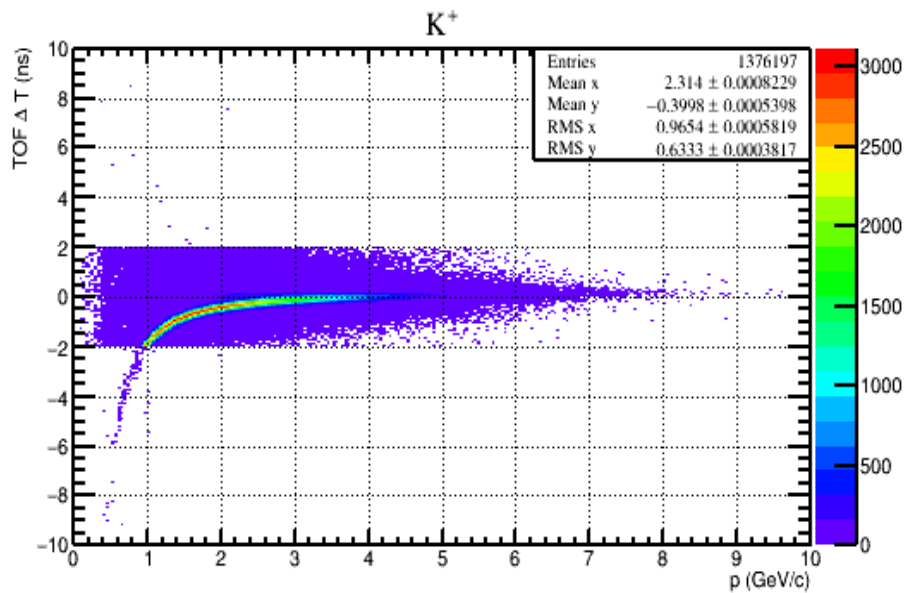
MM² (K+K-) Inv.M

(g1 g2) Inv.M Beam Energy



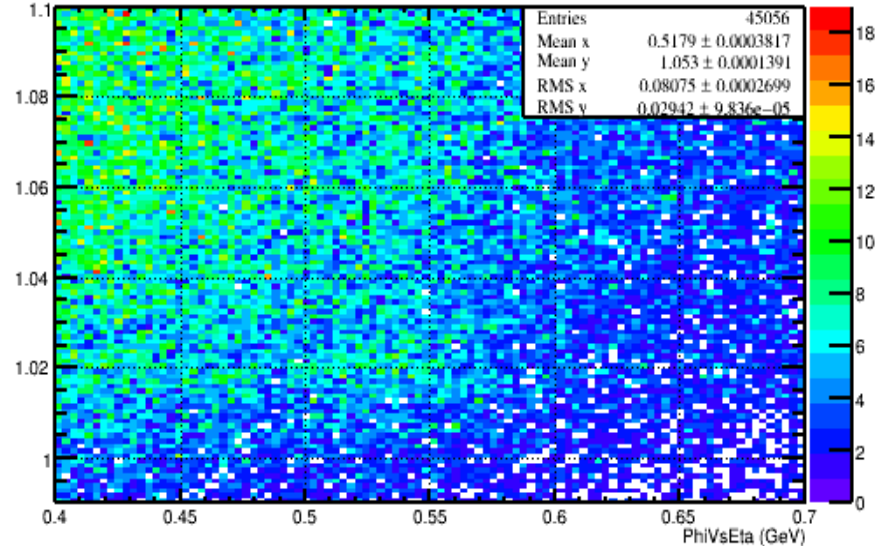
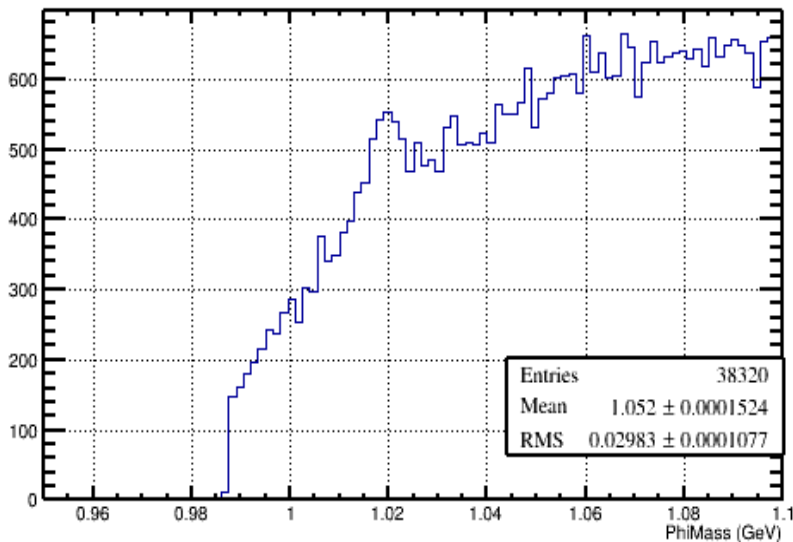
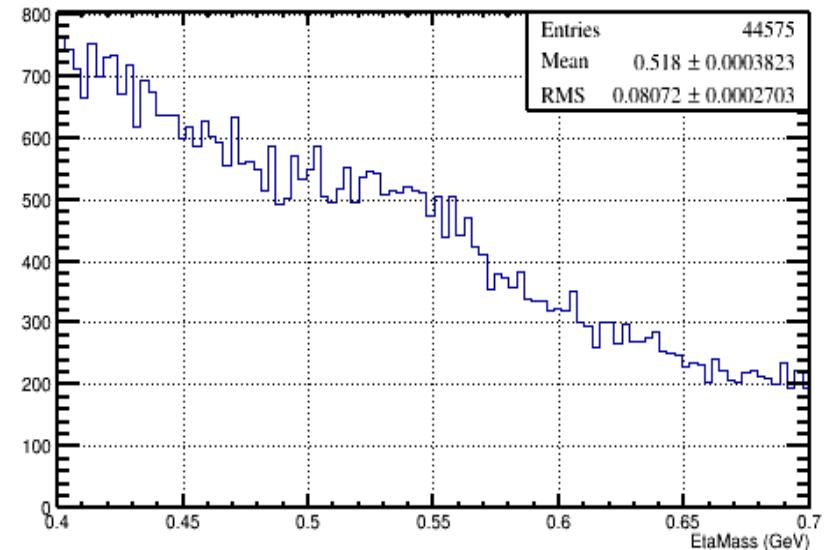
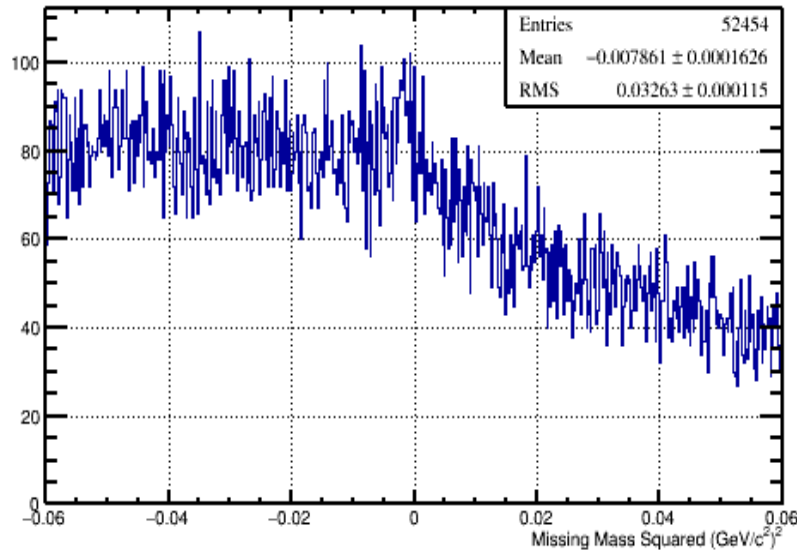
KPlus (lin z)
KPlus (log z)

KMinus (lin z)
KMinus (log z)



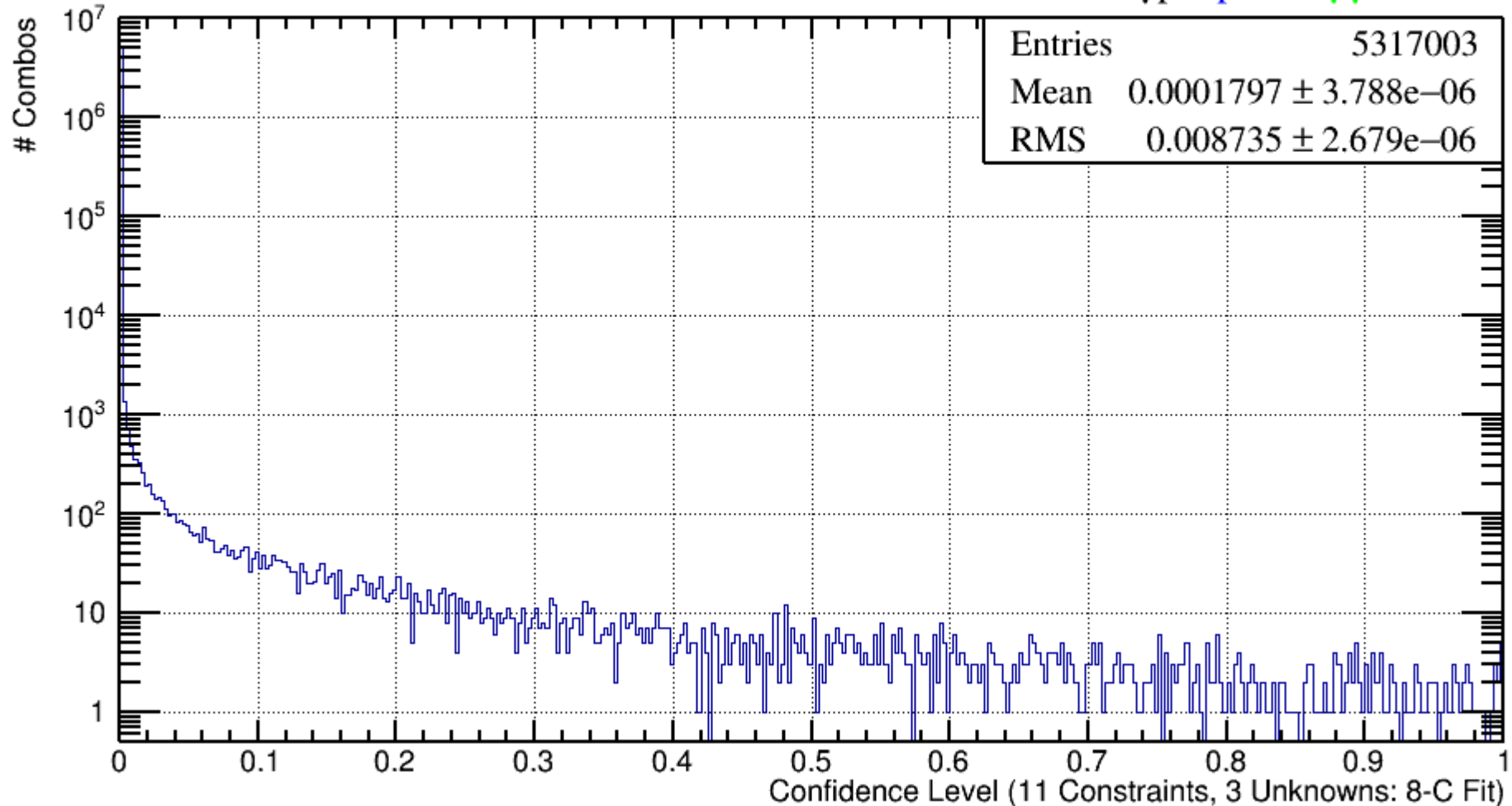
MM² (K+K-) Inv.M

(g1 g2) Inv.M Beam Energy

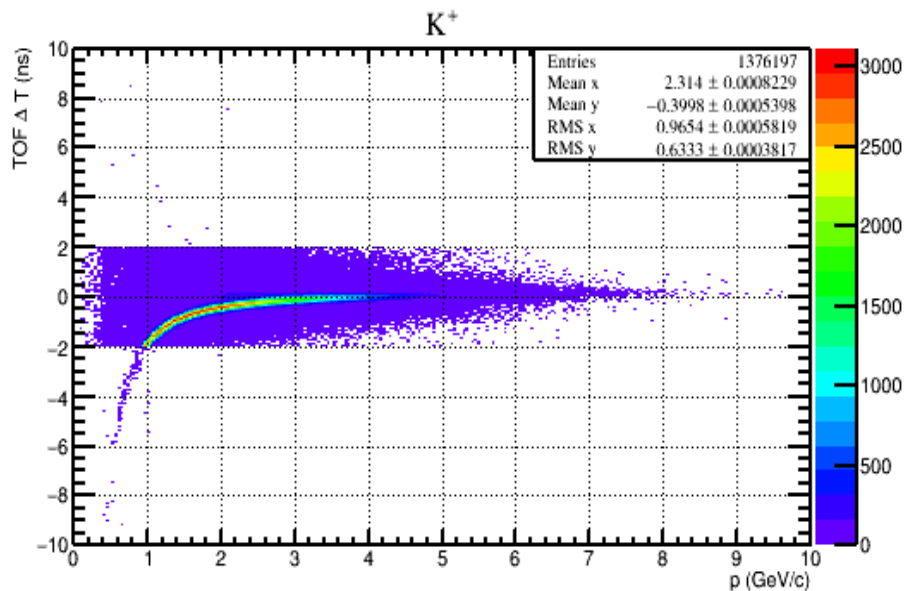


Kinematic Fit Confidence Level:

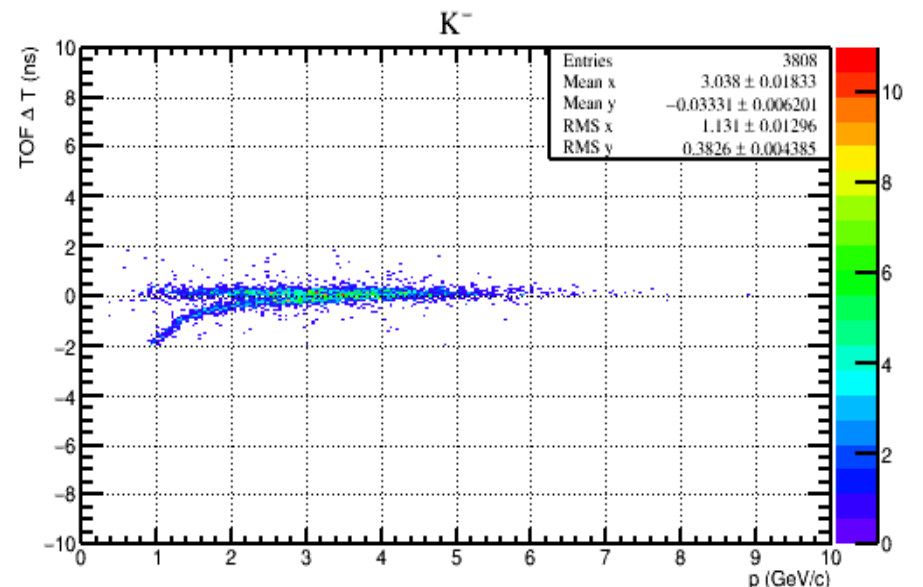
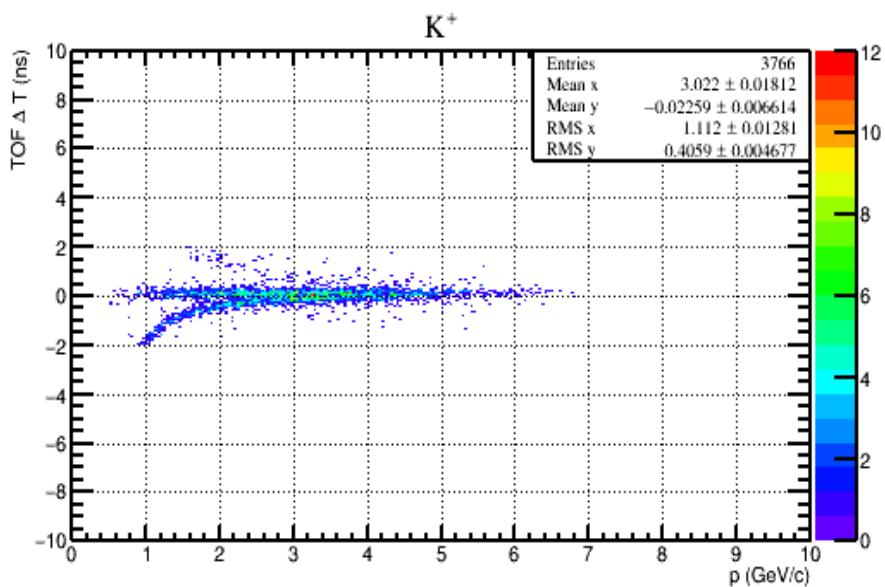
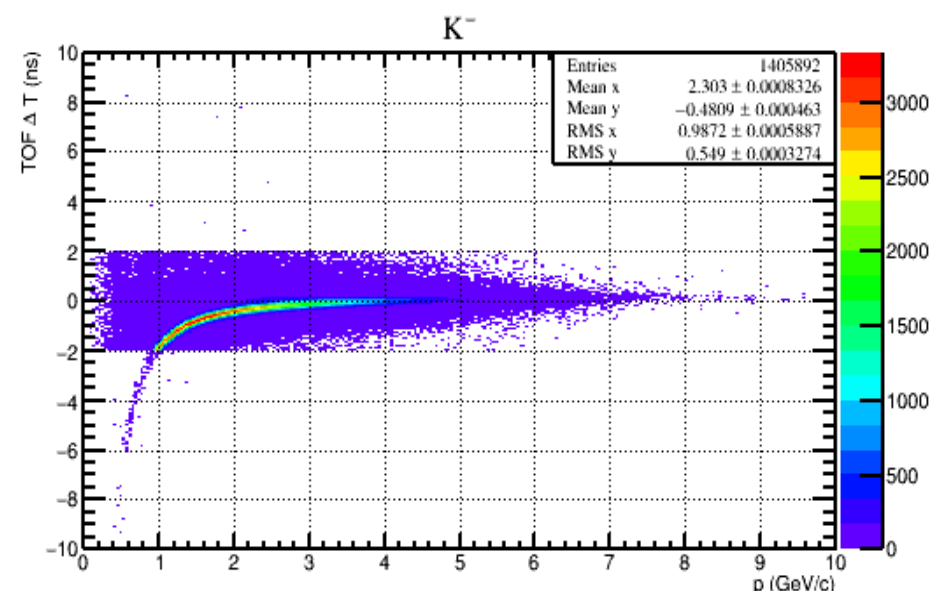
Kinematic Fit Constraints: p^4 , m_η , $x^3_{\gamma p \rightarrow pK^+K^-\gamma\gamma}$



KPlus (before cut)
KPlus (2% cut)

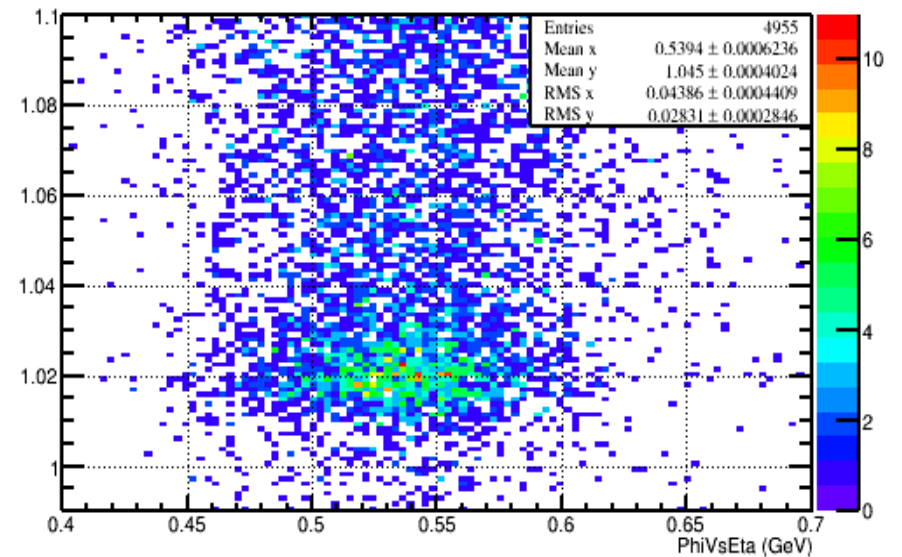
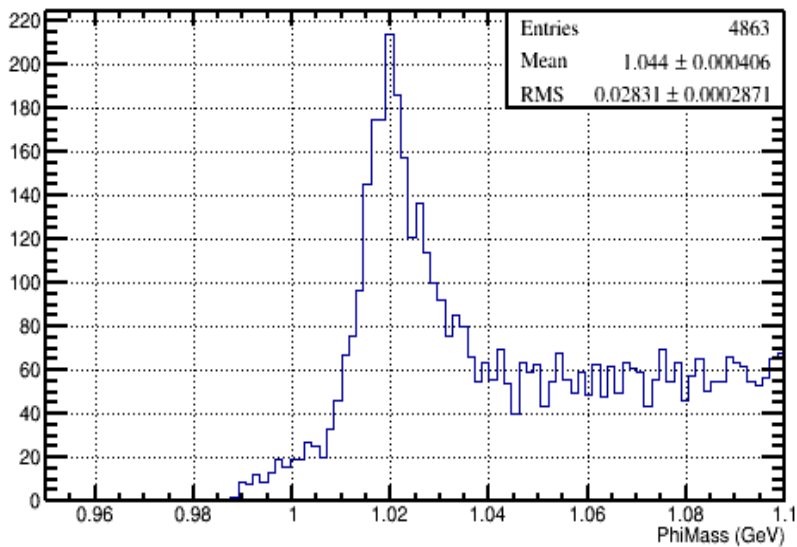
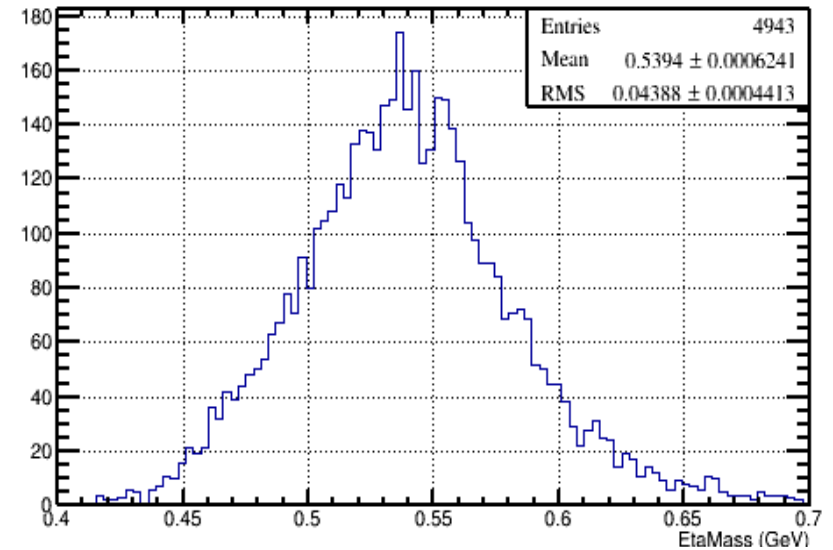
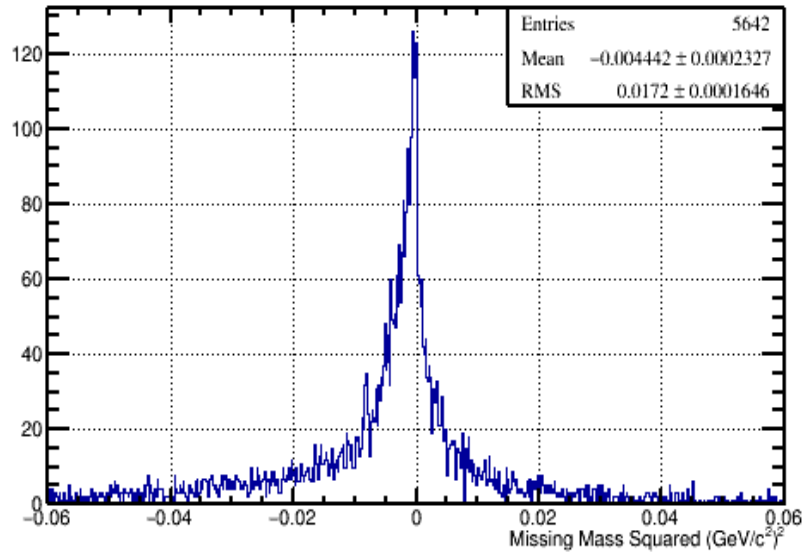


KMinus (before cut)
KMinus (2% cut)



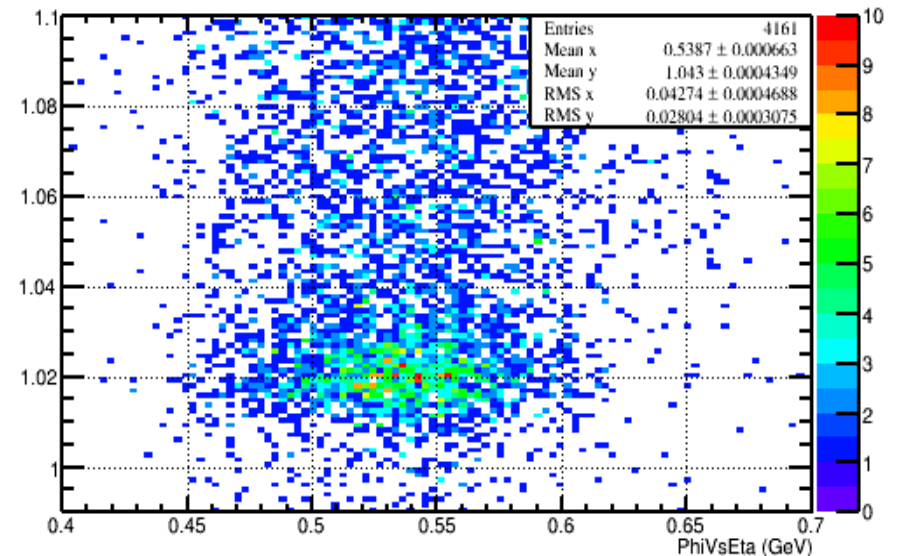
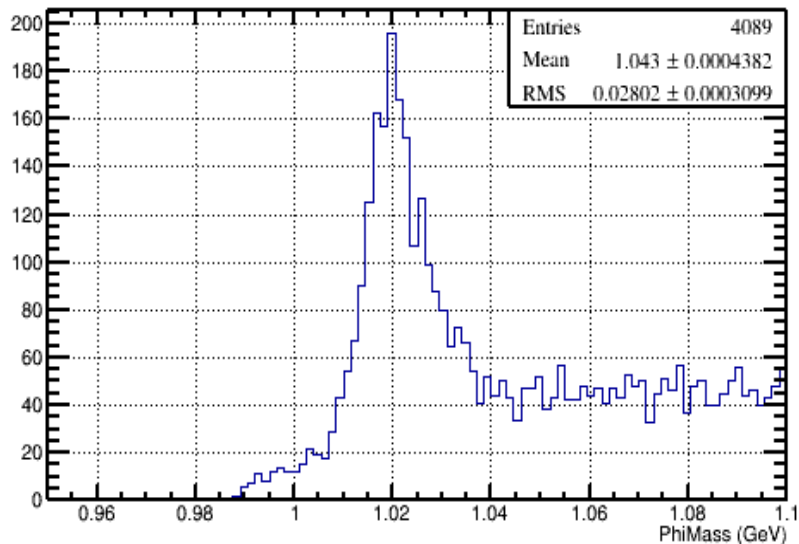
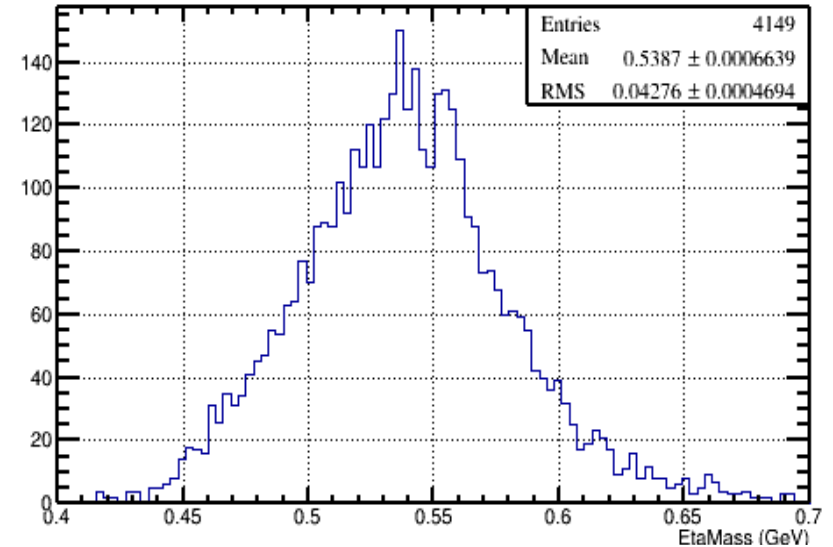
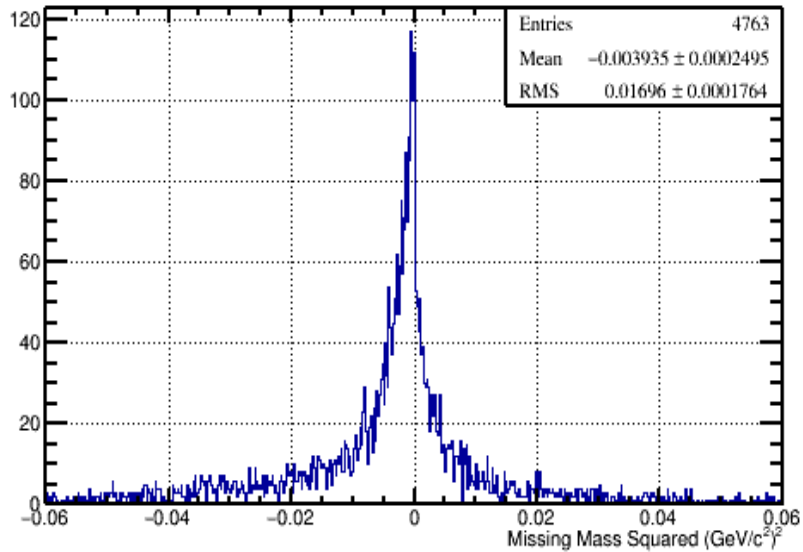
MM² (K+K-) Inv.M

(g1 g2) Inv.M Beam Energy

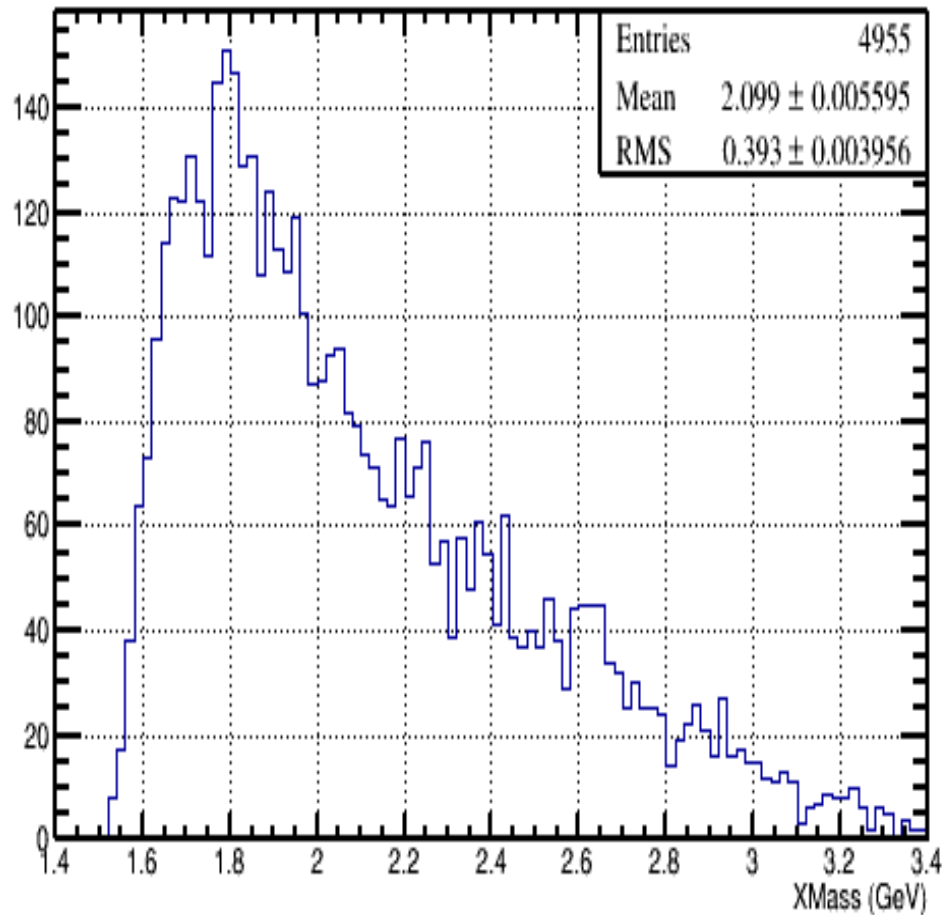


MM² (K+K-) Inv.M

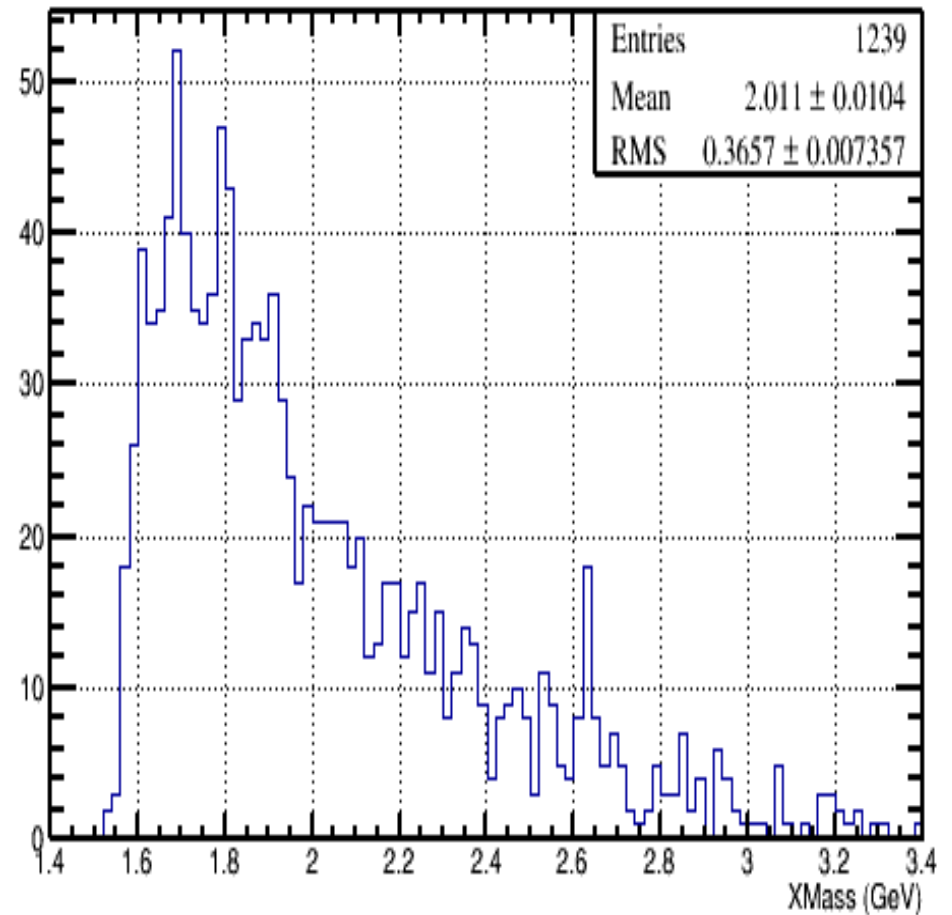
(g1 g2) Inv.M Beam Energy



XMass (no cuts)



XMass (ellip. cut)



Conclusions/Observations

- The topology $\gamma p \rightarrow p \phi(\eta)$ is still a working progress due to the fact that I cannot observe a phi meson (critical to phi eta analysis)
- The topology $\gamma p \rightarrow p \phi \eta$ has made tremendous improvements in the phi and eta invariant mass spectra due to the kinematic fit confidence level cuts
- Observing a phi meson with little to no background at GlueX may require the amplitudes of the pion/kaon band to be equal in the ΔT vs P_{TOF} plot
- Are we observing multiple excited strangeonia states in the phi eta invariant mass plot?