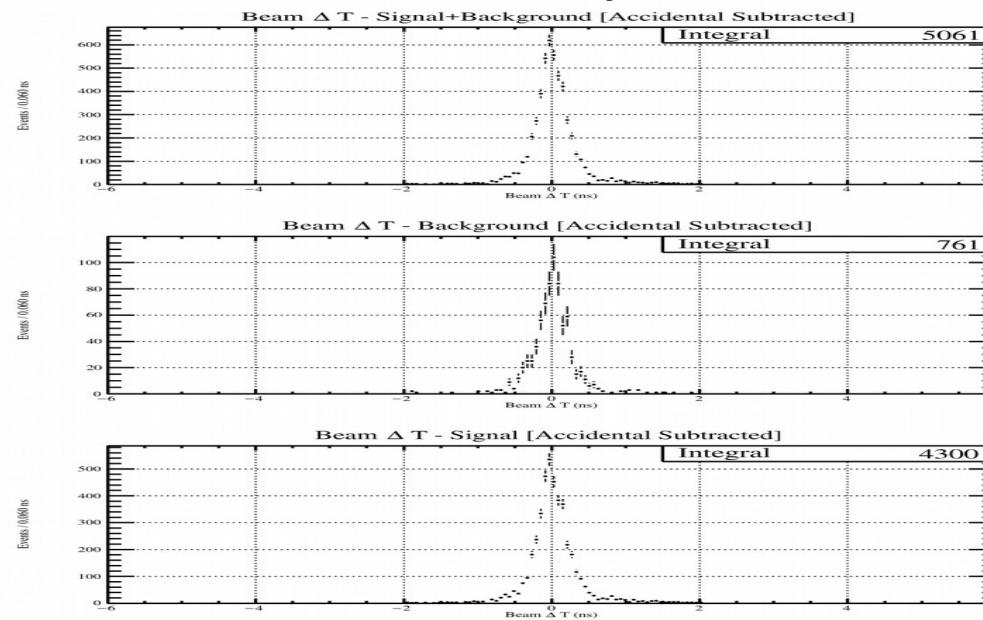


List of things this talk will discuss:

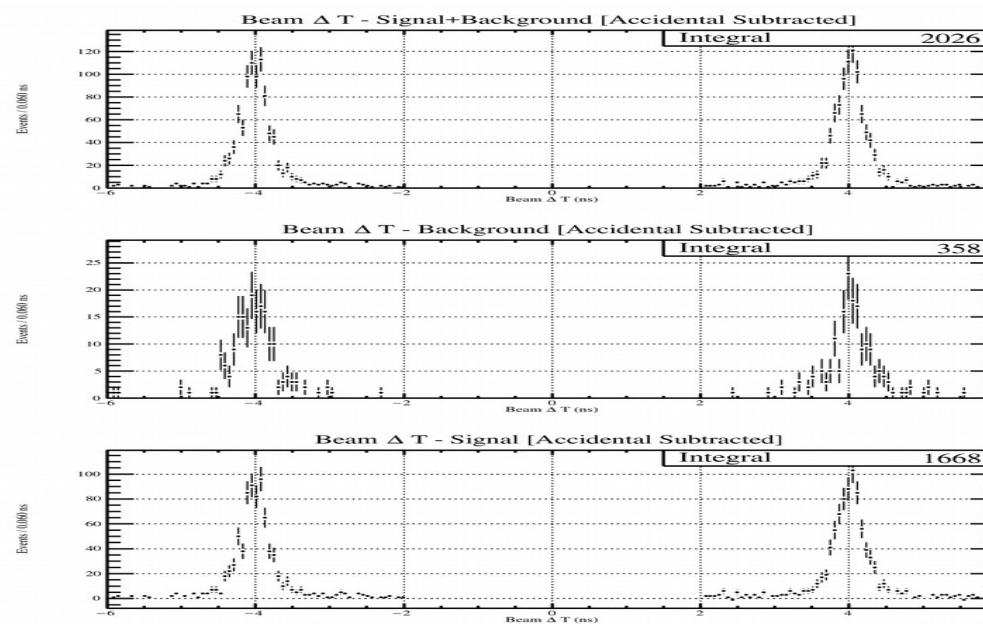
- Comparison between the primary beam peak and the accidental beam peak (physics)
- Study to justify the number of nearest neighbors
- Chebyshev Polynomial Test study
- New Qvalue Study Results for Phi and Eta
- New Qvalue PhiEta Study
- Table of Results

Beam Timing

Primary

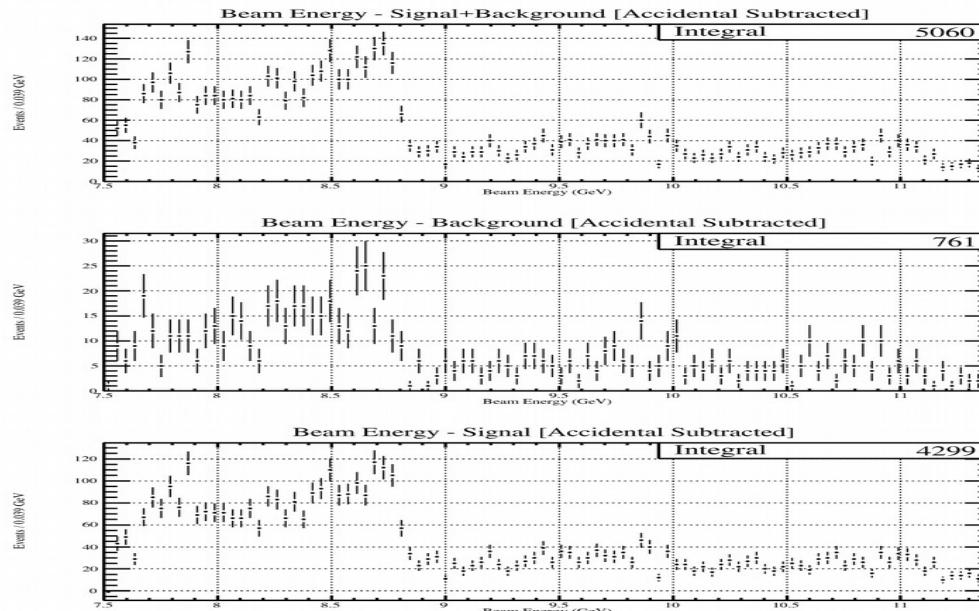


Accidental

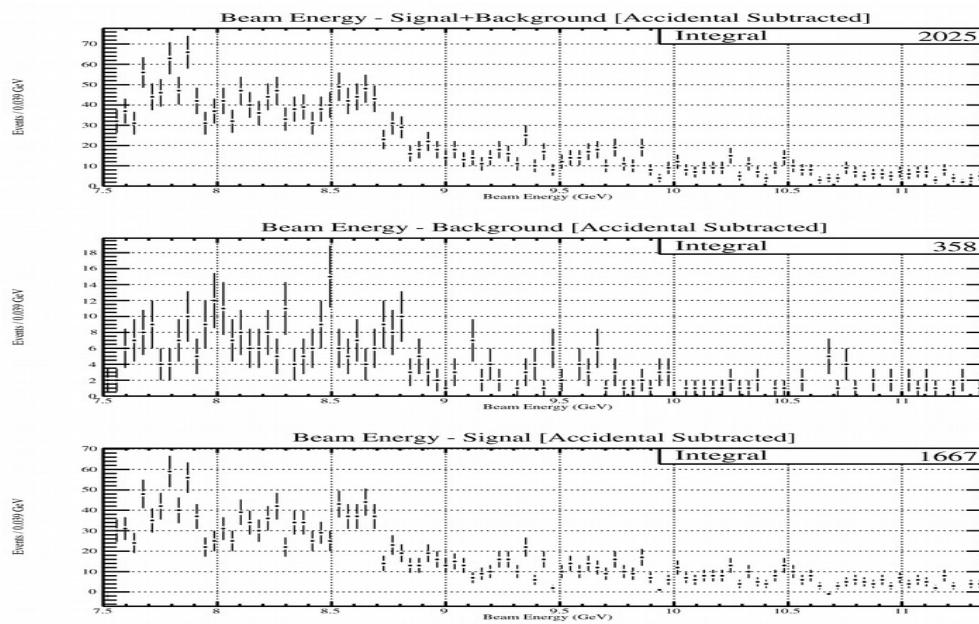


Beam Energy

Primary

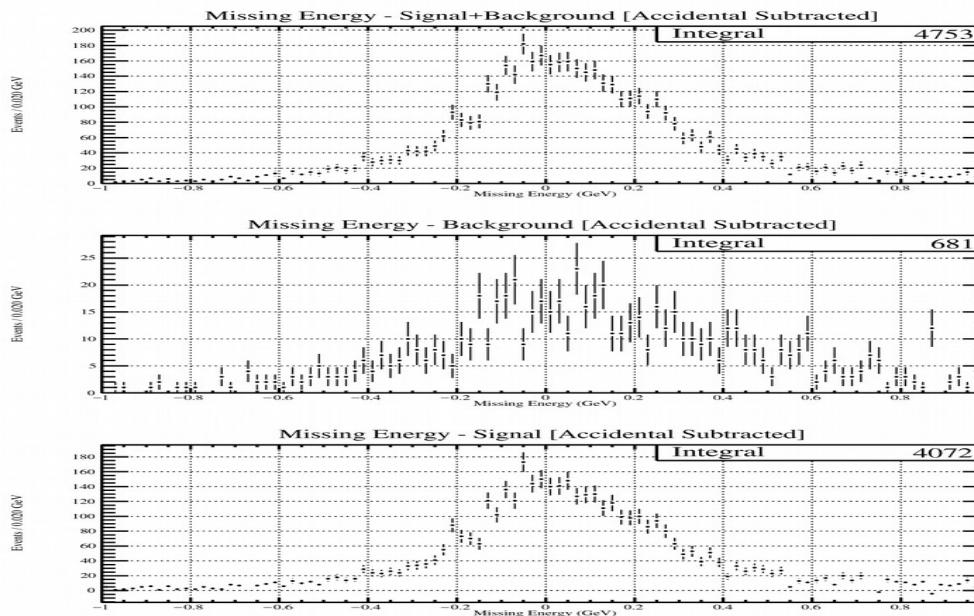


Accidental

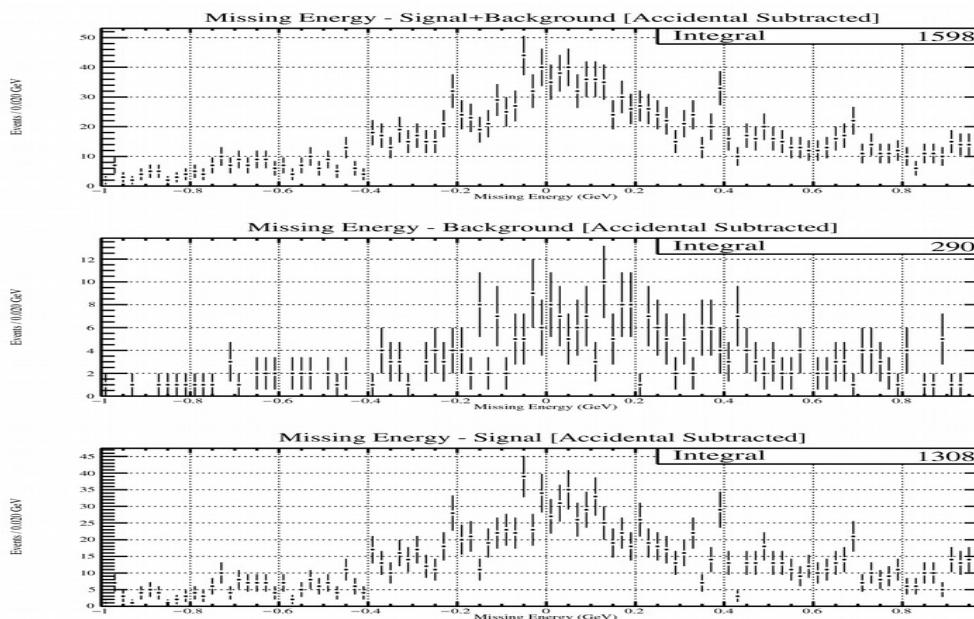


Missing Energy

Primary

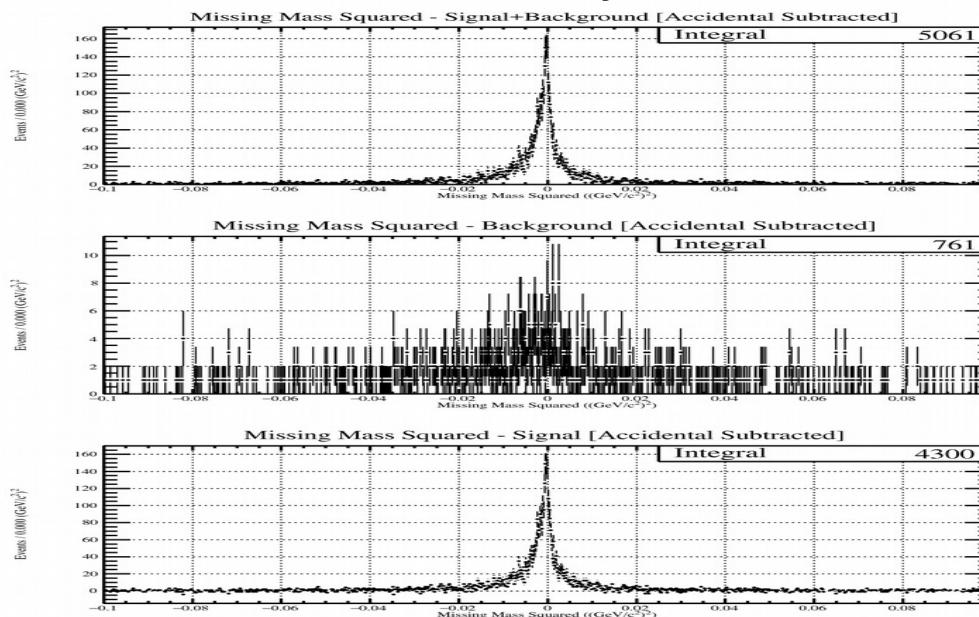


Accidental

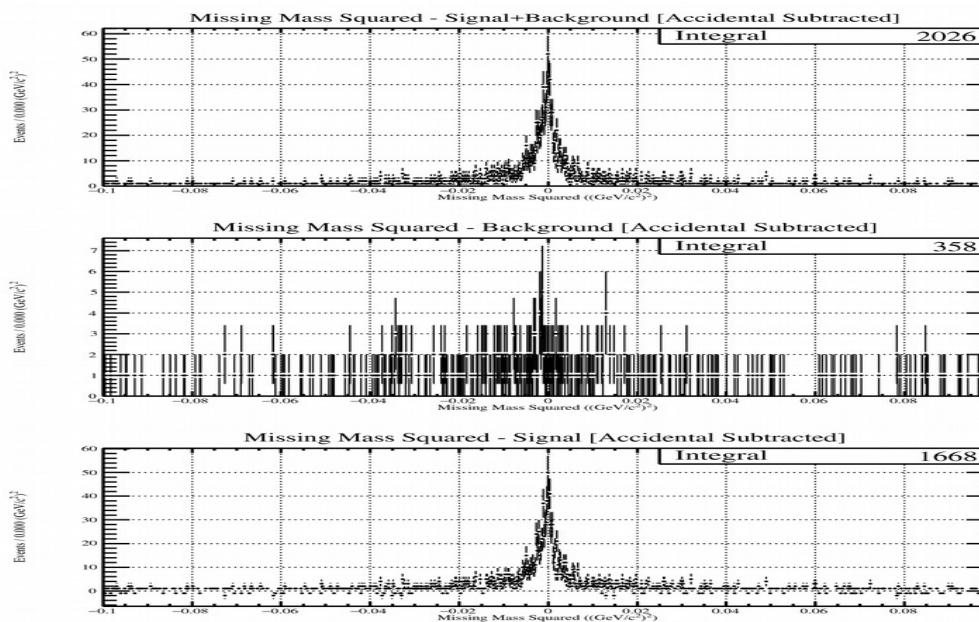


Missing Mass Squared

Primary

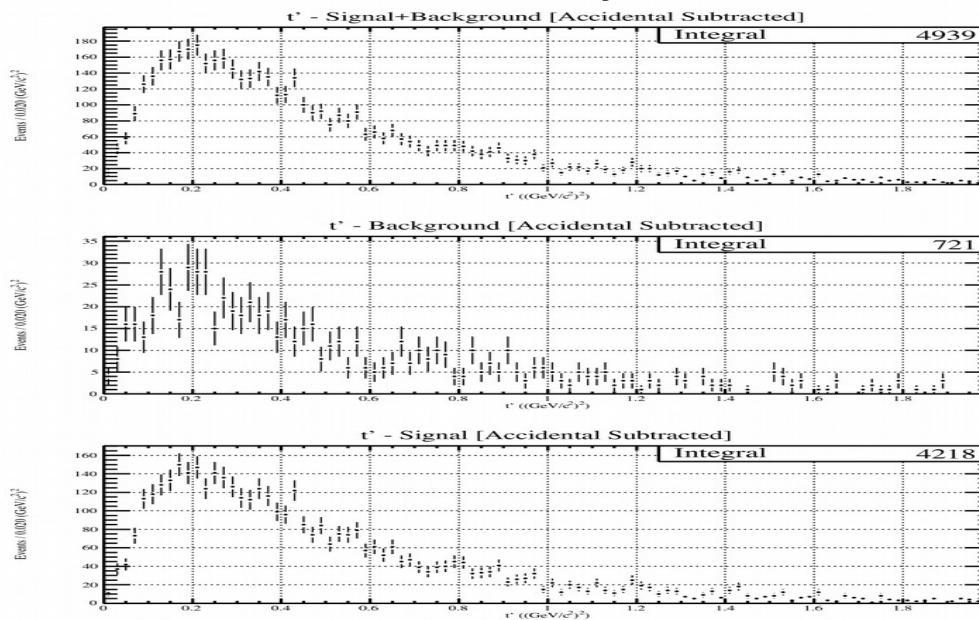


Accidental

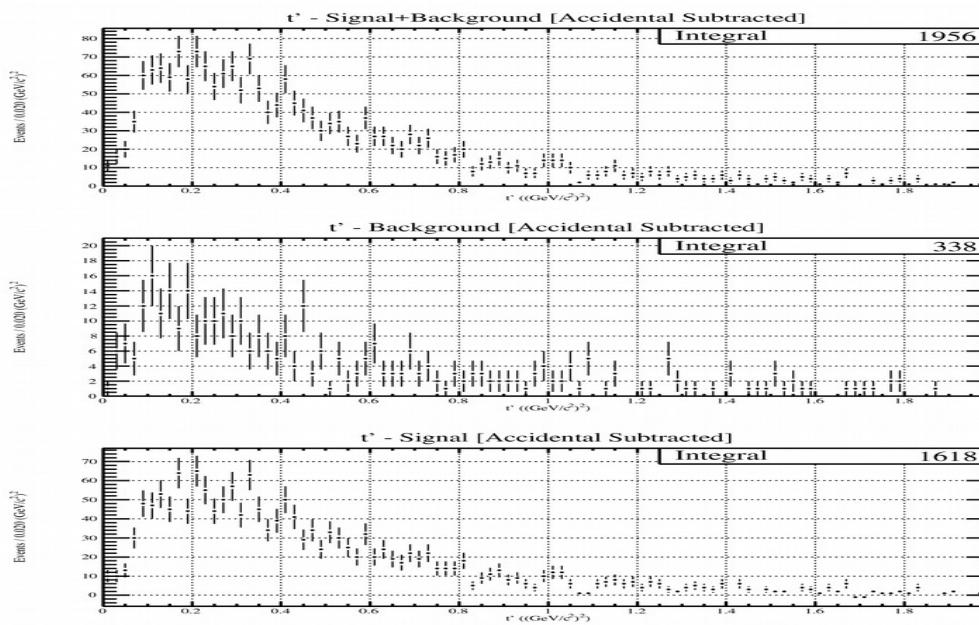


t'

Primary

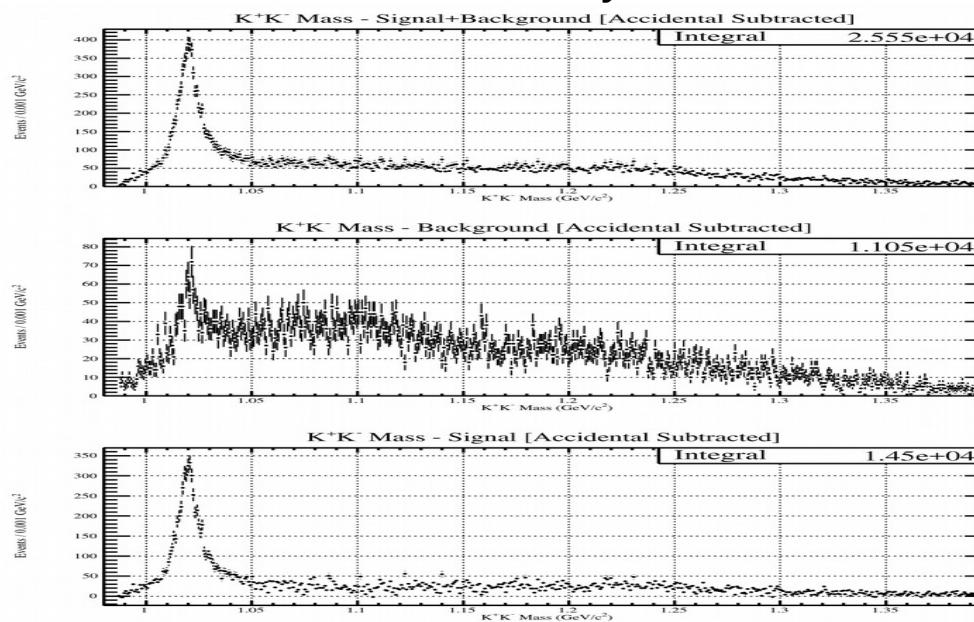


Accidental

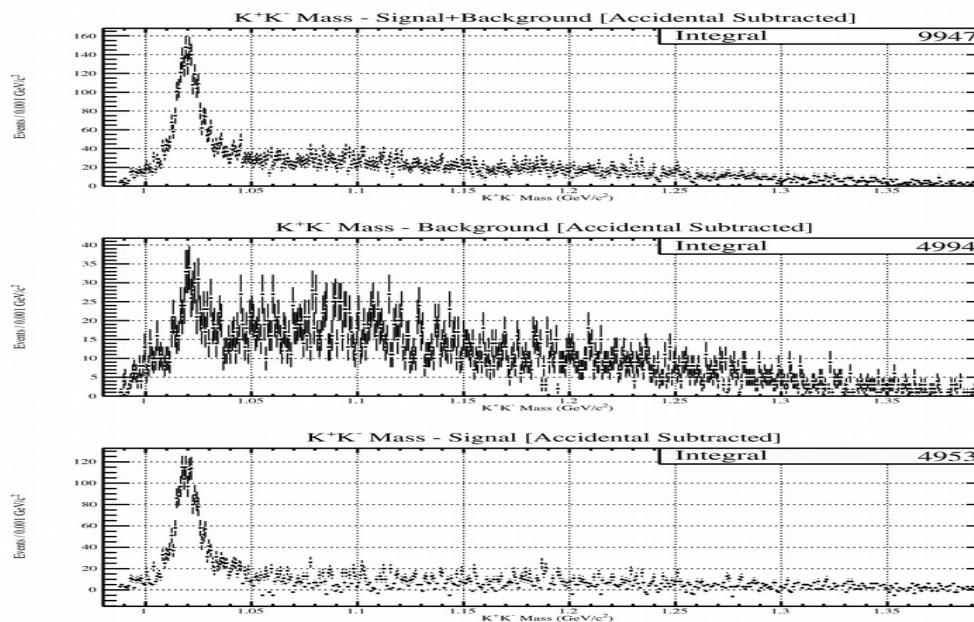


K+K- Invariant Mass

Primary

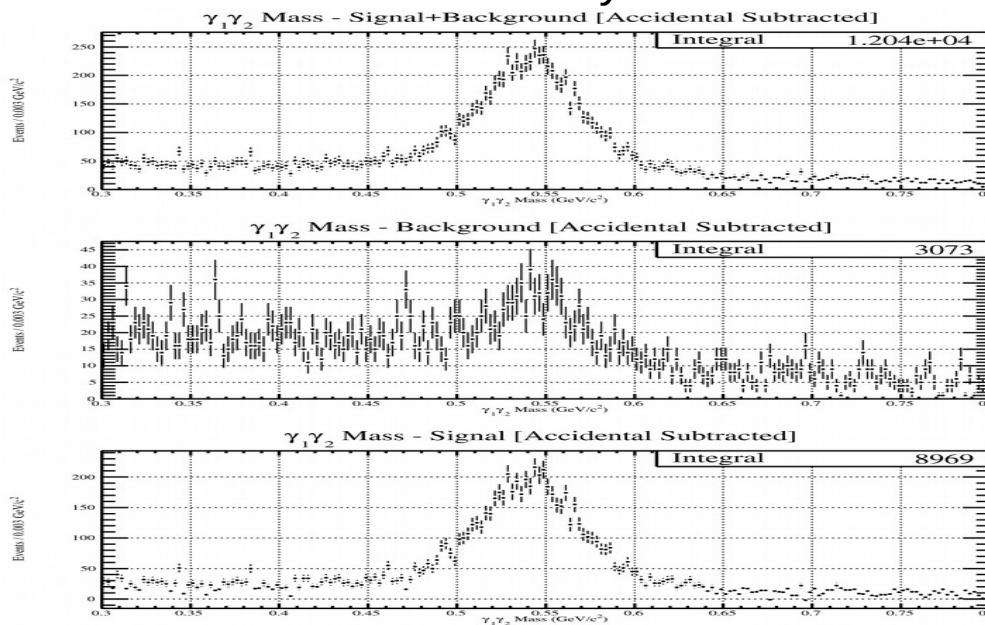


Accidental

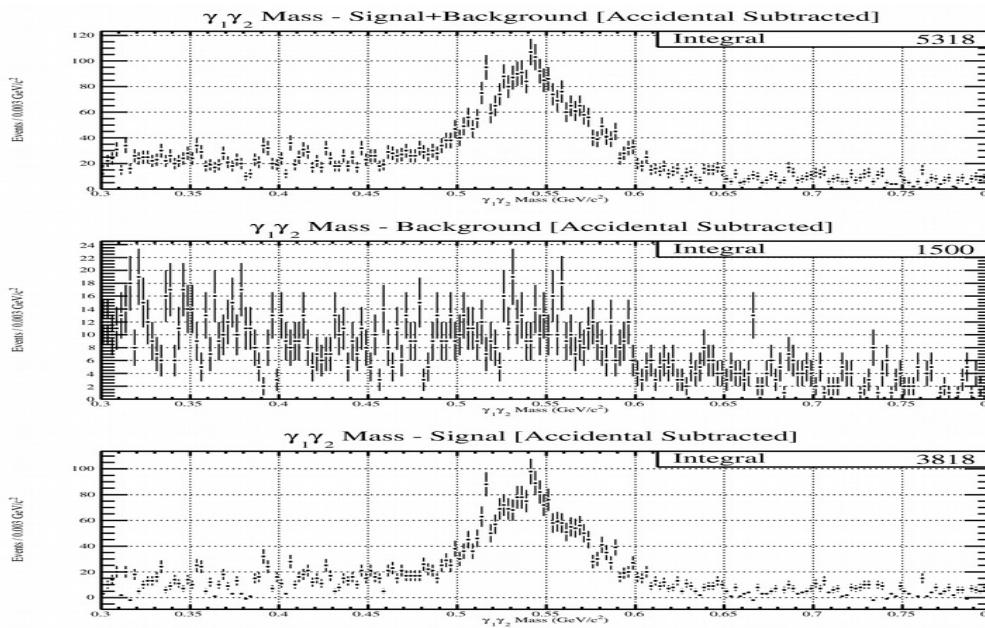


Gamma Gamma Invariant Mass

Primary

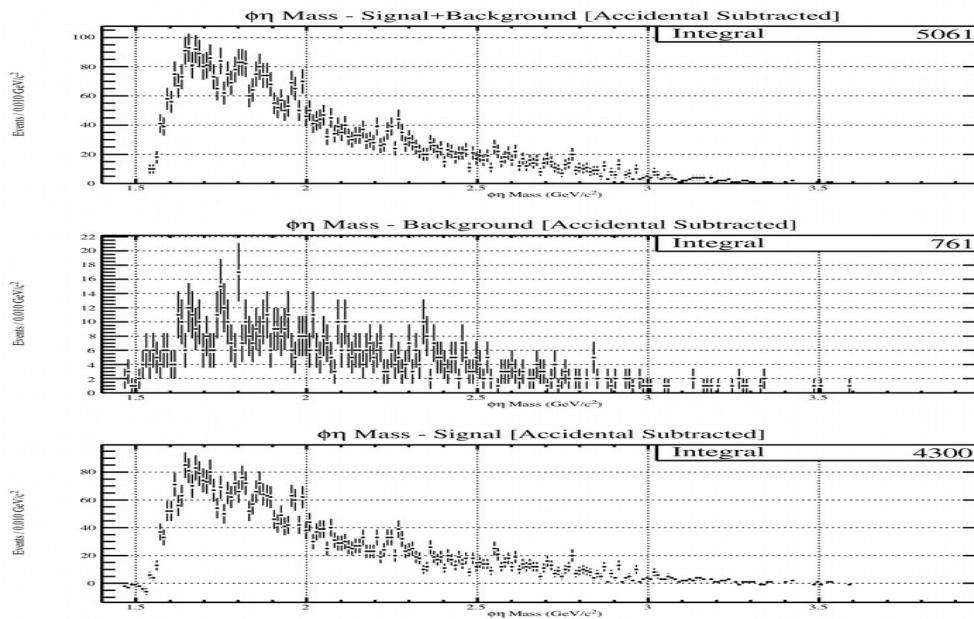


Accidental

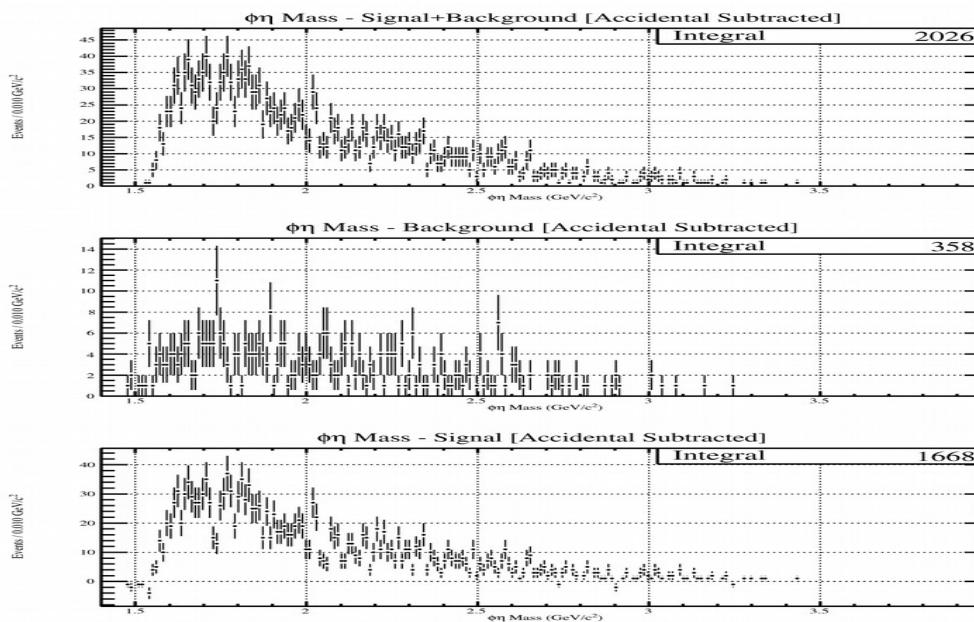


PhiEta Invariant Mass

Primary

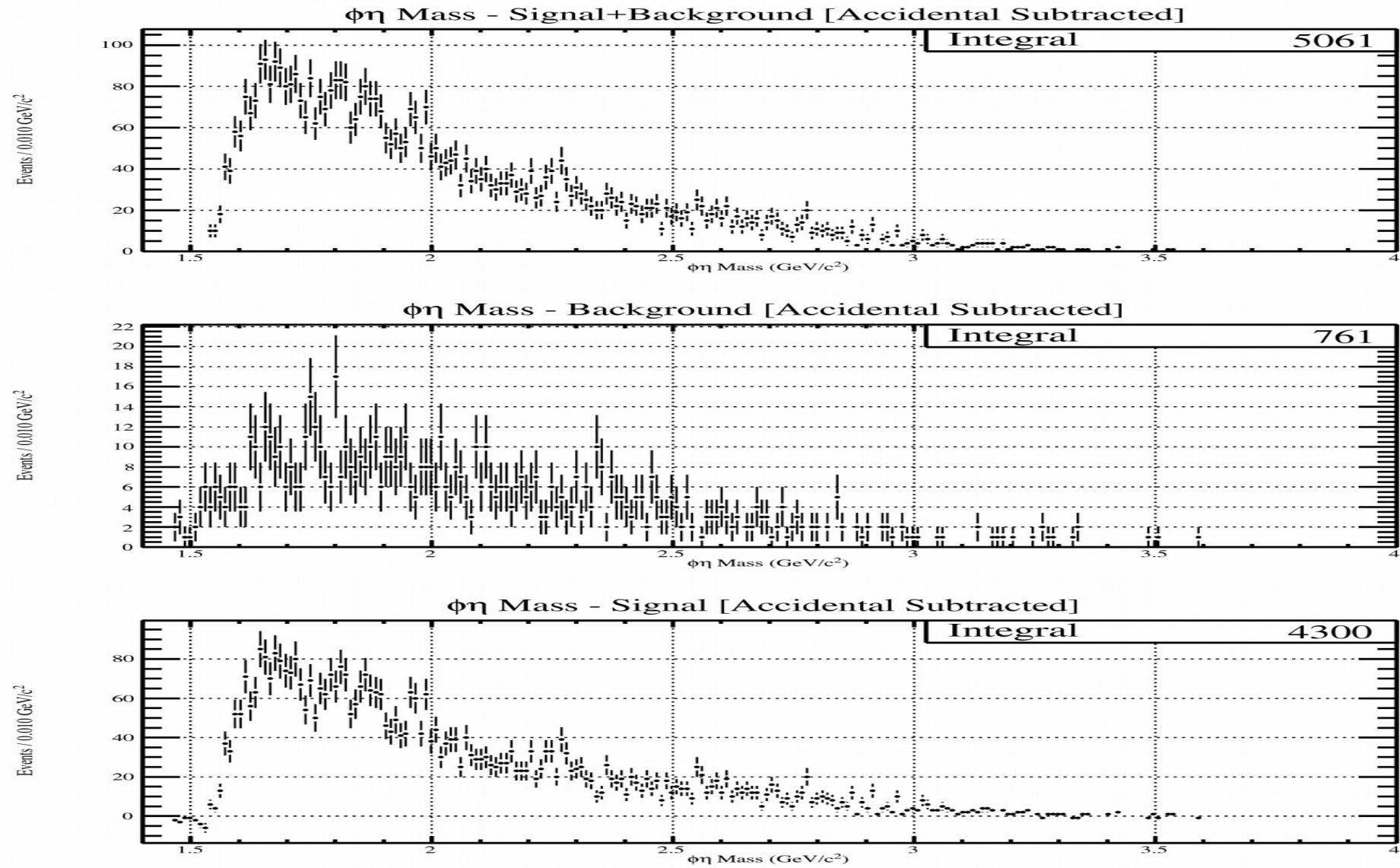


Accidental



PhiEta Invariant Mass

Primary



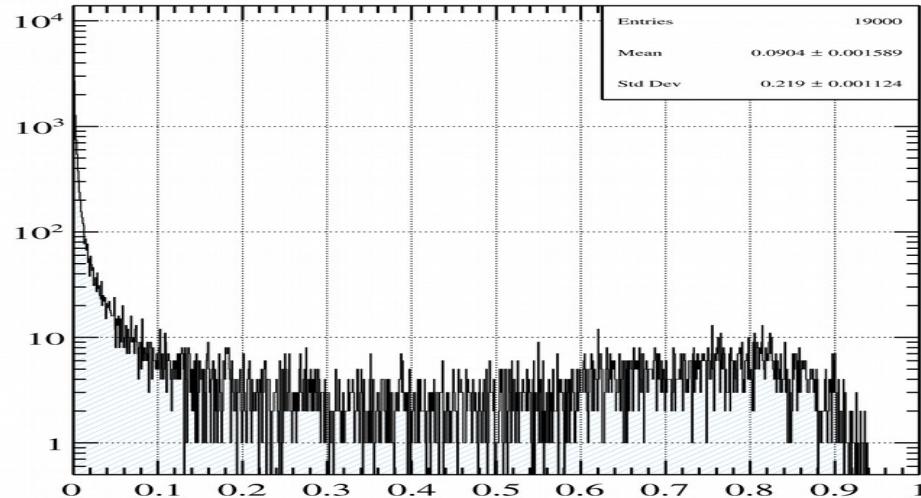
Qvalue Studies:

- I have changed the background function to a 3rd degree Chebyshev polynomial for both Phi and Eta Fits
- I have changed the signal function to a Voigtian, where I fix the mass and width parameter of the Lorentizan (Breit Wigner), and allow the amplitude and resolution to be free (Gaussian) for both Phi and Eta
- I do not have results for a Phi fit with 2k nearest neighbors, or an Eta fit with 5k nearest neighbors (both lost connection to hnpgrid while running last night)
- All other results will be shown

Weight Distributions for different Phi NN

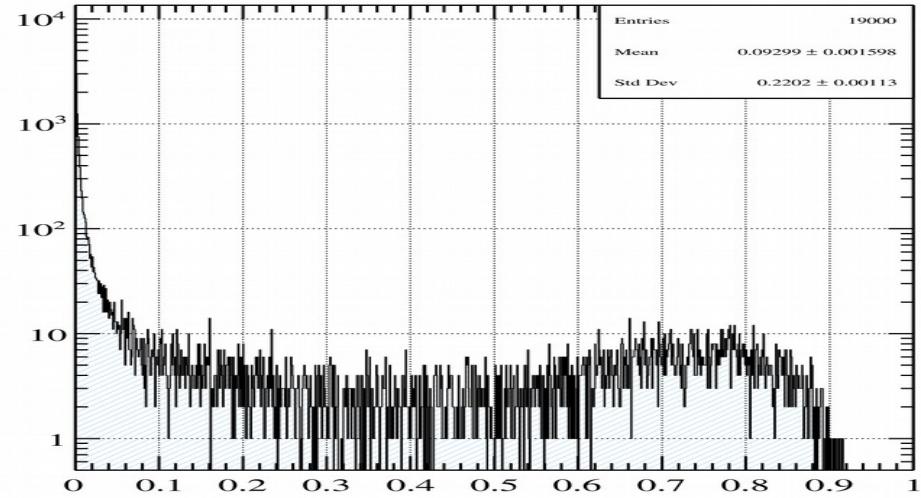
NN = 1K

QValue_hist



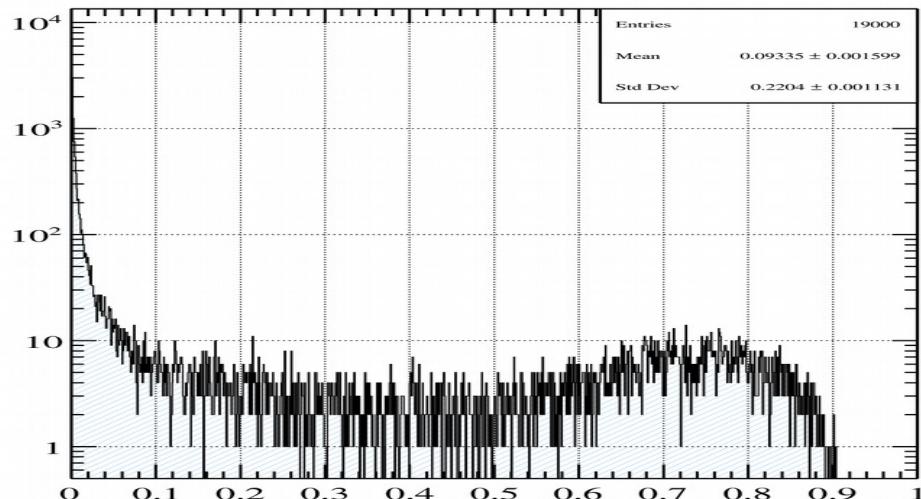
NN = 3K

QValue_hist



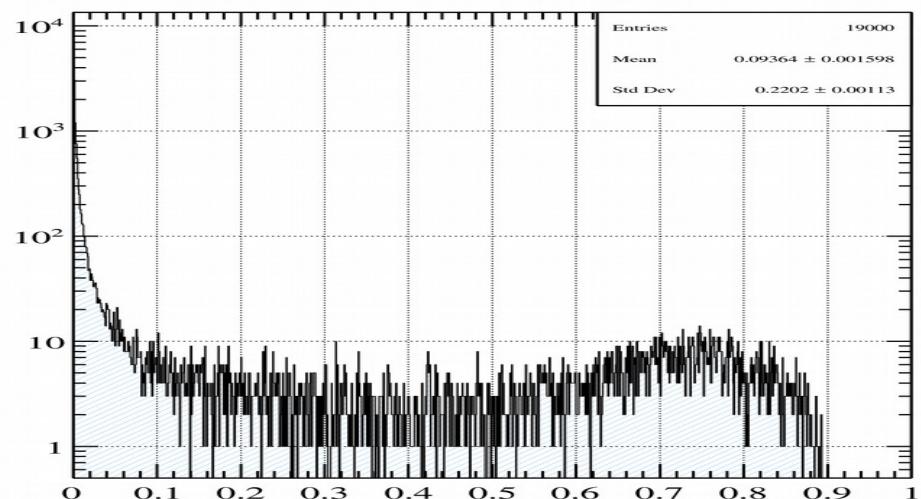
NN = 4K

QValue_hist



NN = 5K

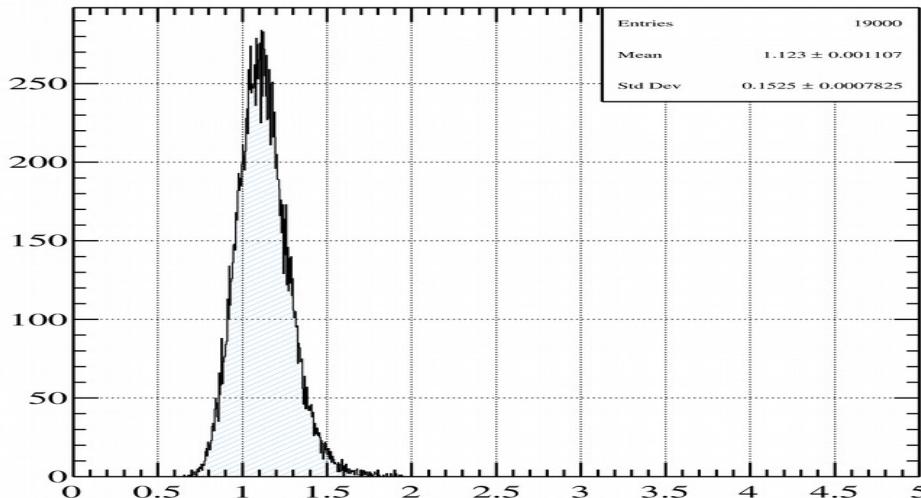
QValue_hist



Chi^2 Distributions for different Phi NN

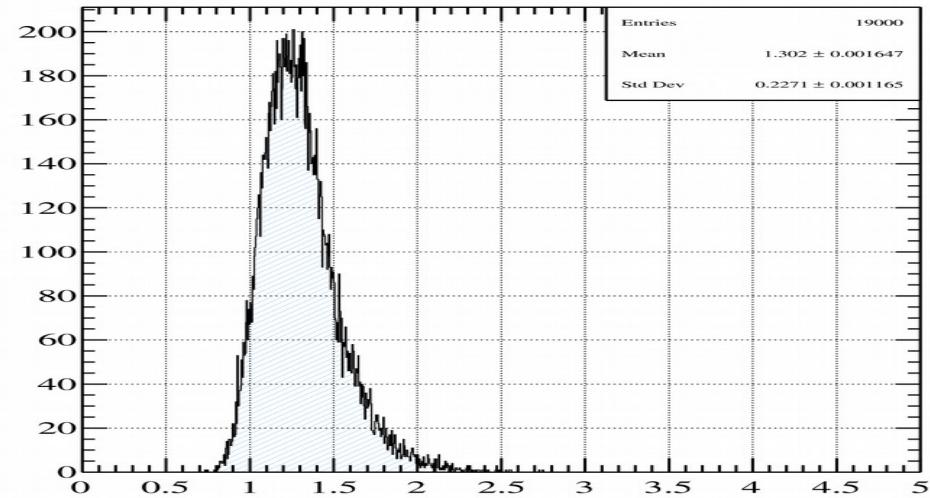
NN = 1K

ChiSq_hist



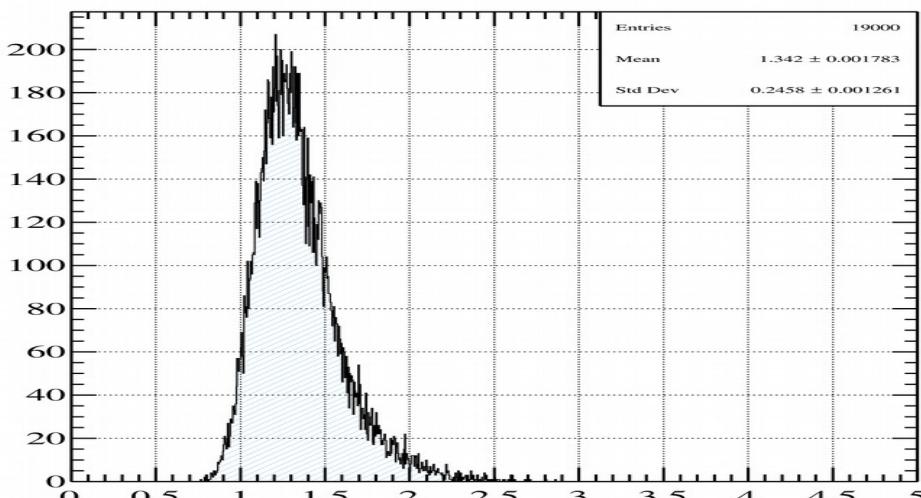
NN = 3K

ChiSq_hist



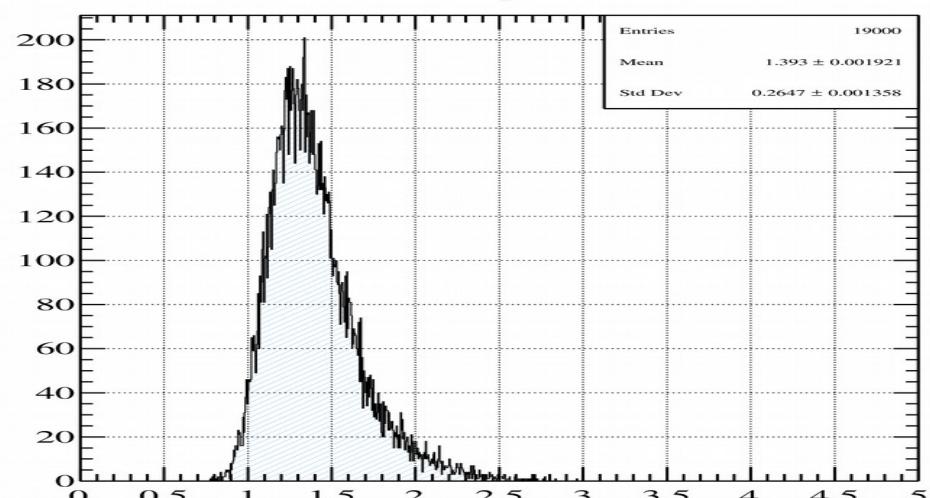
NN = 4K

ChiSq_hist



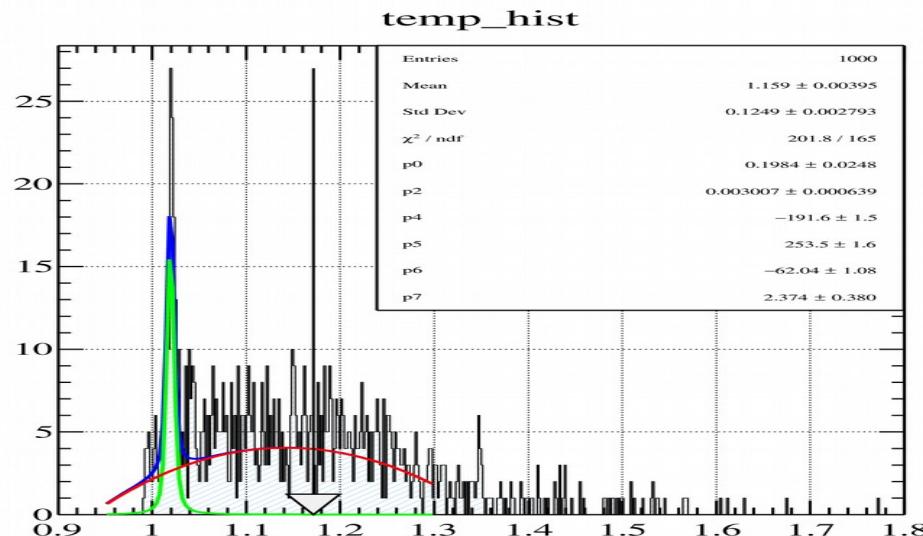
NN = 5K

ChiSq_hist



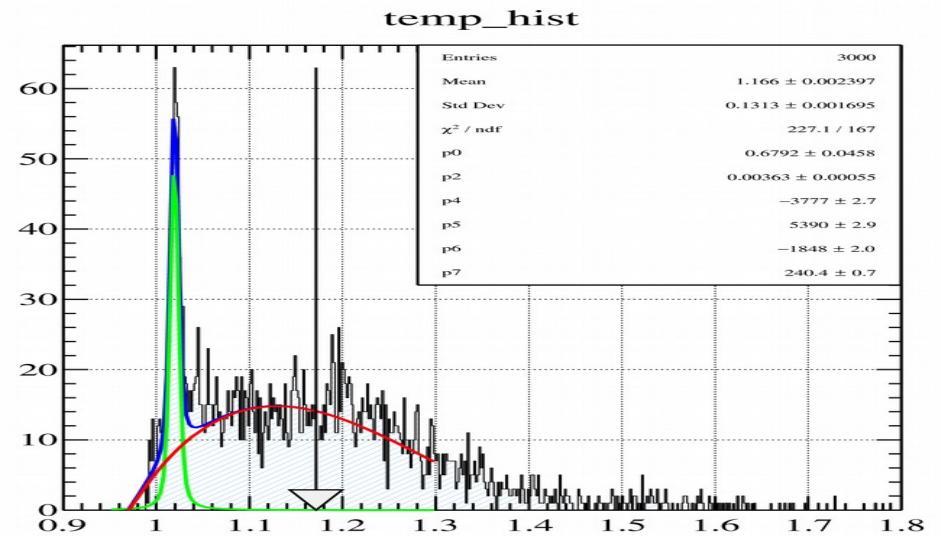
Example Fits (event5) for different Phi

NN = 1K

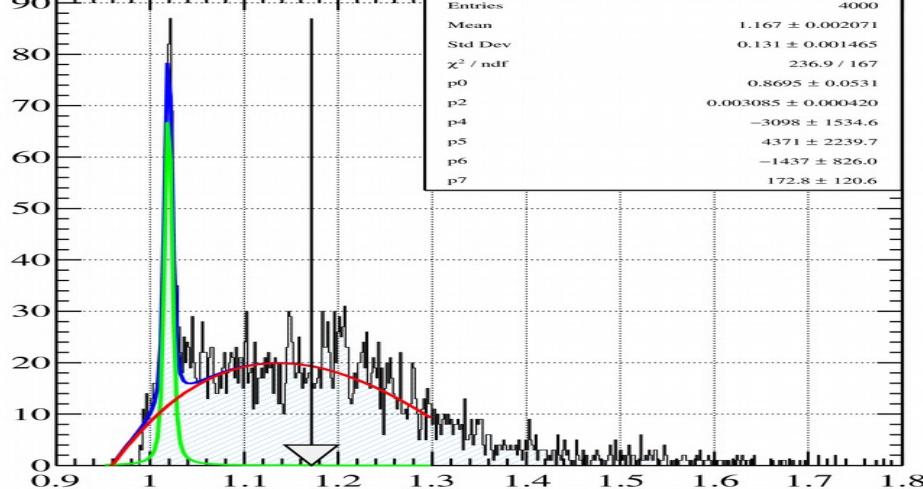


NN

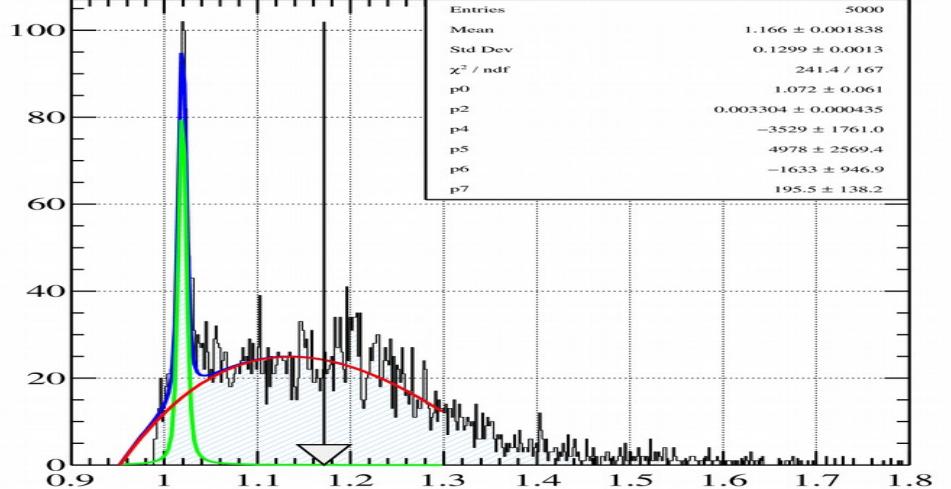
NN = 3K



NN = 4K

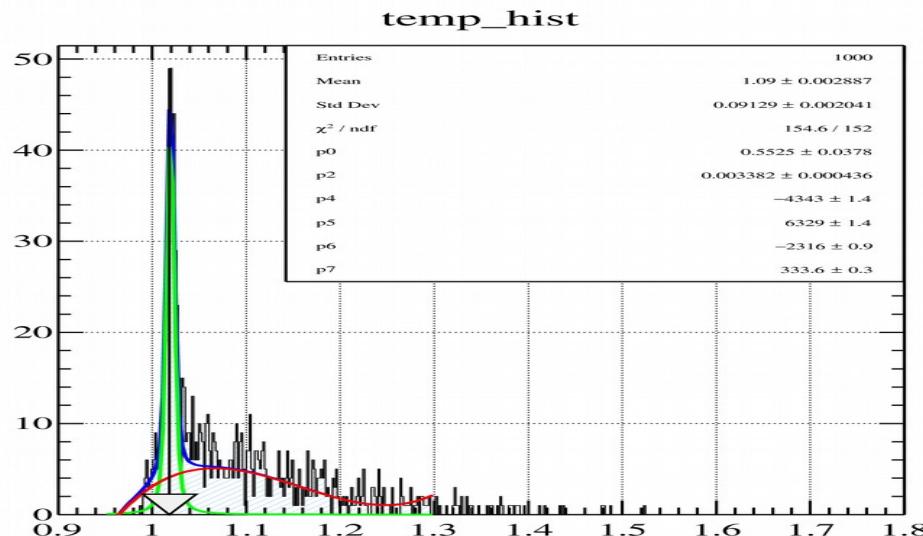


NN = 5K



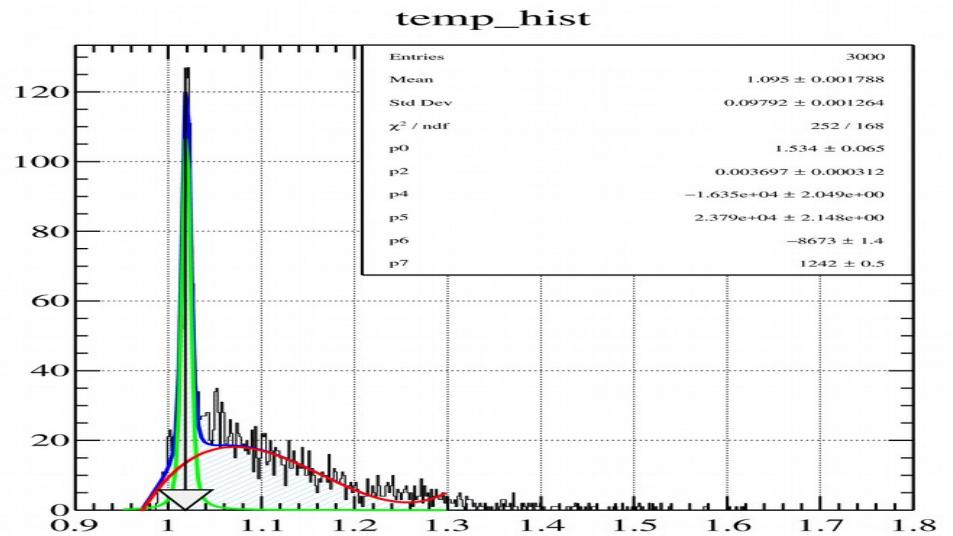
Example Fits (event9) for different Phi

NN = 1K

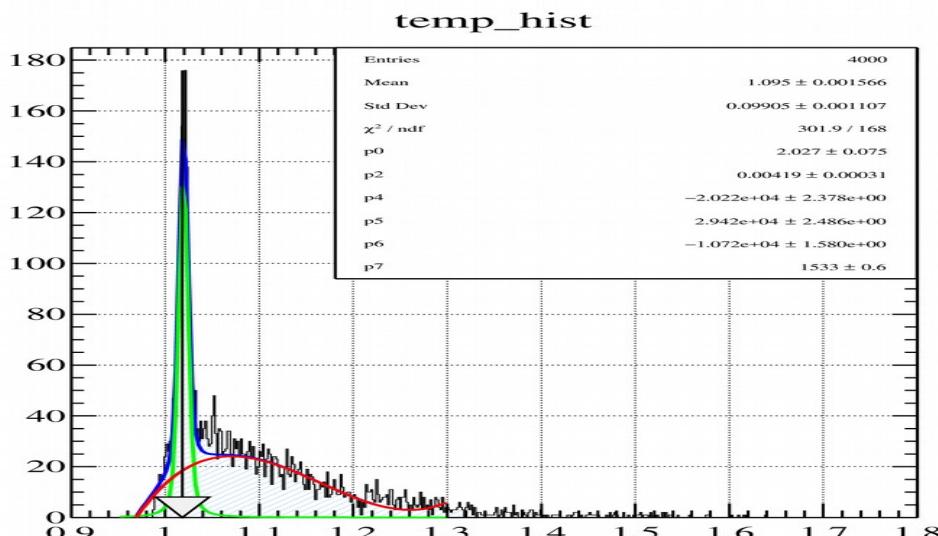


NN

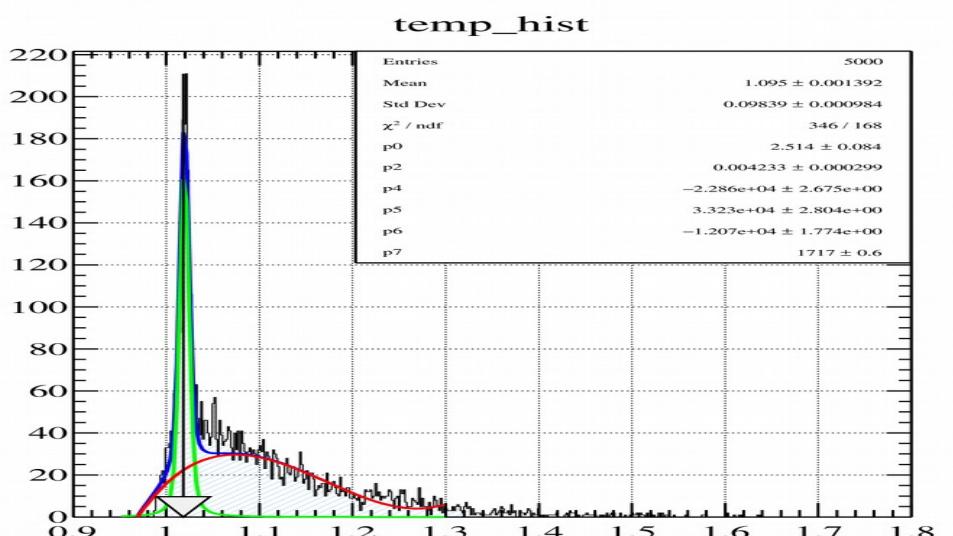
NN = 3K



NN = 4K



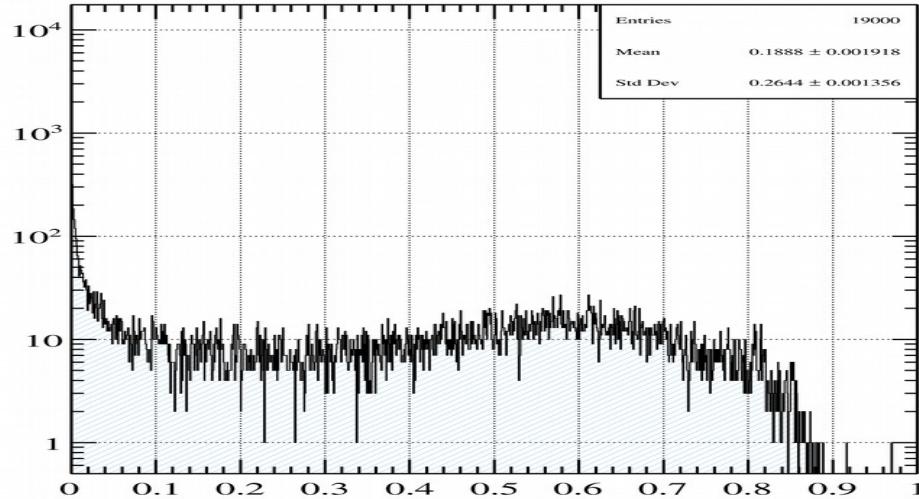
NN = 5K



Weight Distributions for different Eta NN

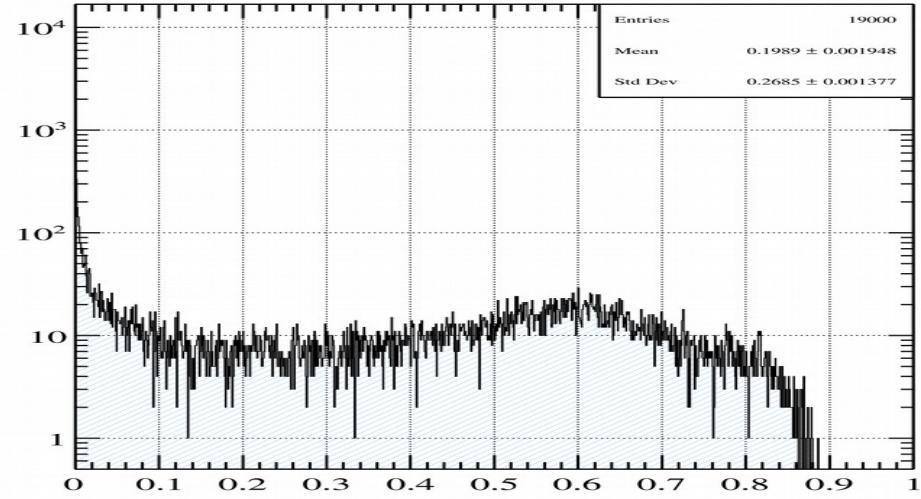
NN = 1K

QValue_hist



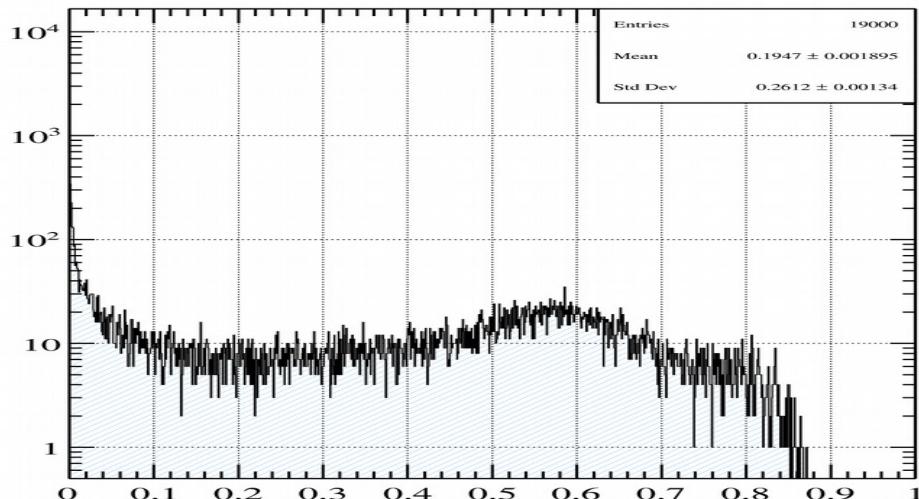
NN = 2K

QValue_hist



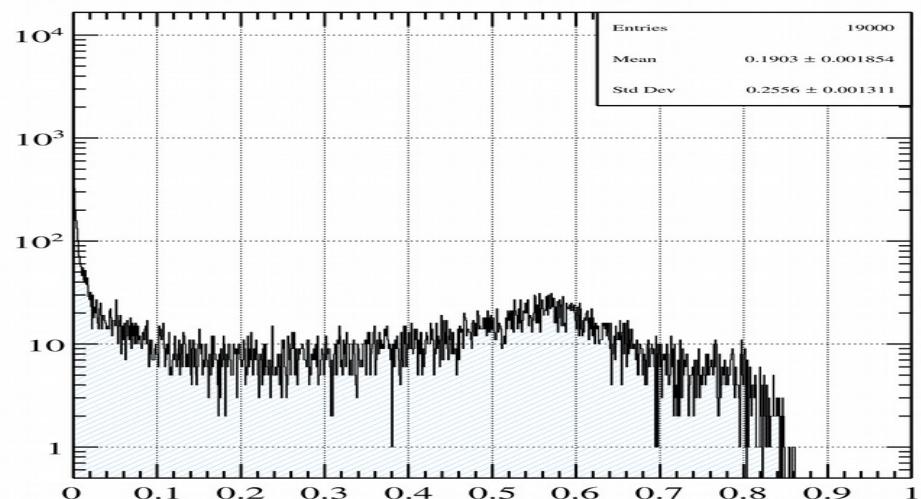
NN = 3K

QValue_hist



NN = 4K

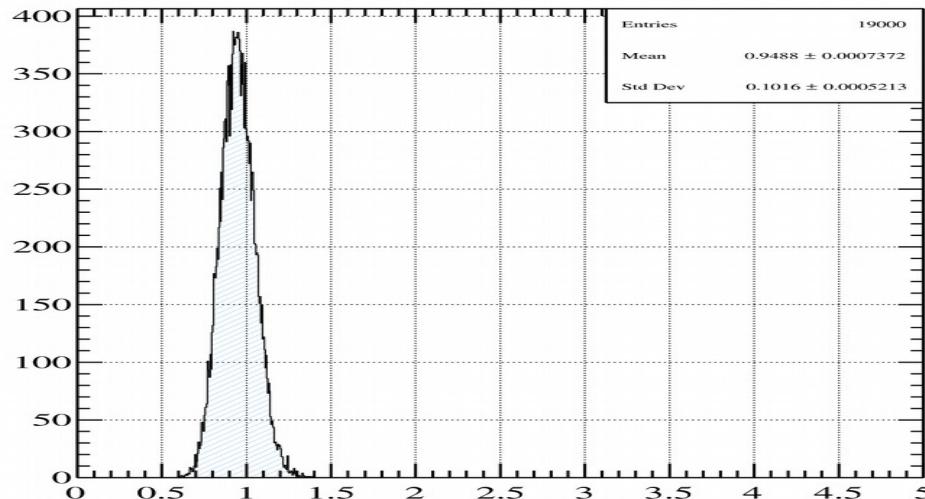
QValue_hist



Chi² Distributions for different Eta NN

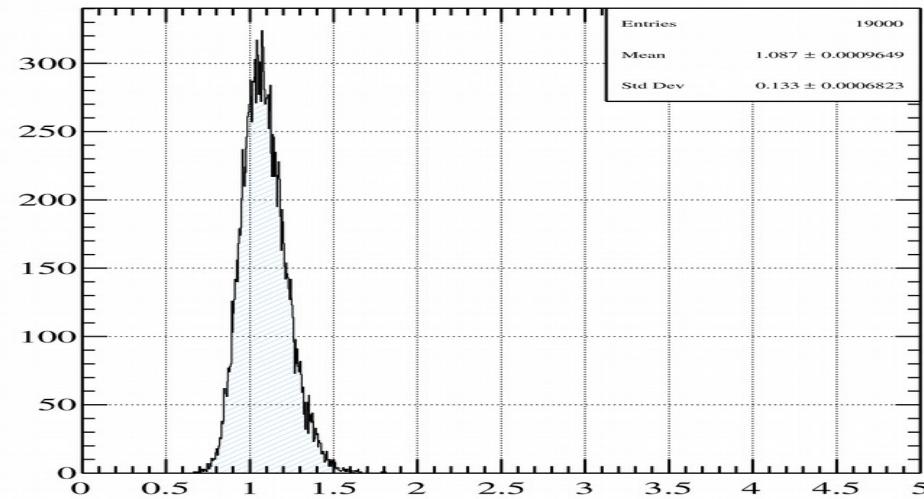
NN = 1K

ChiSq_hist



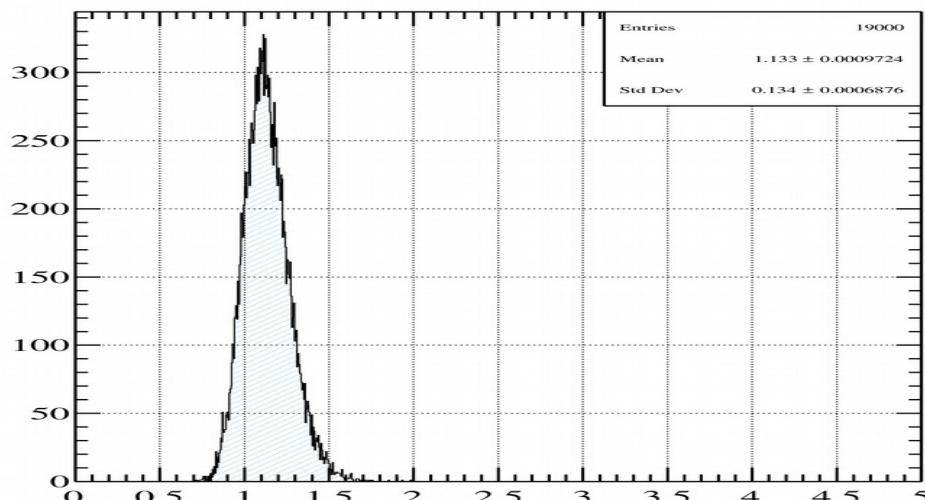
NN = 2K

ChiSq_hist



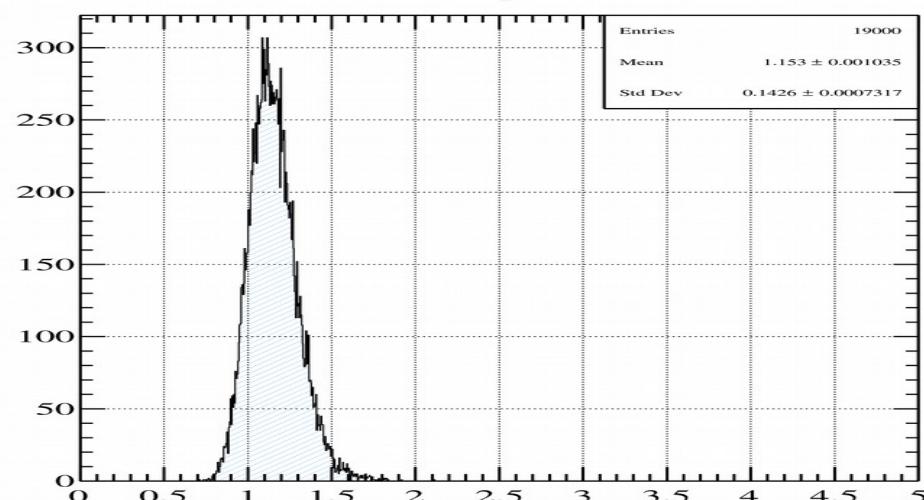
NN = 3K

ChiSq_hist



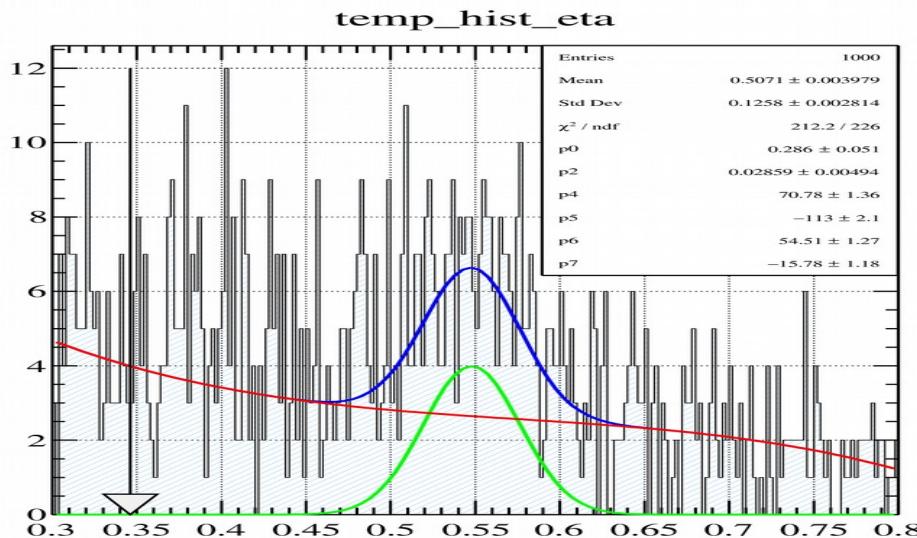
NN = 4K

ChiSq_hist



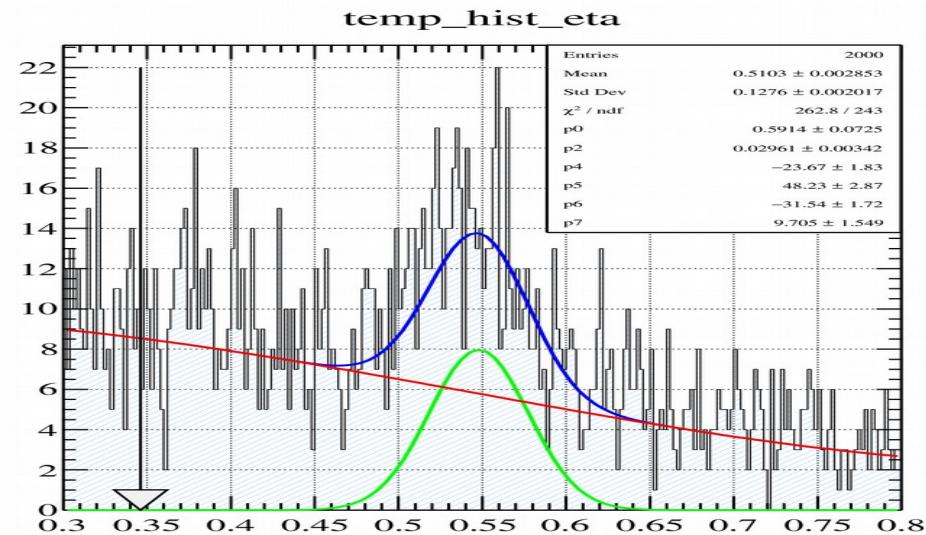
Example Fits (event5) for different Eta

NN = 1K

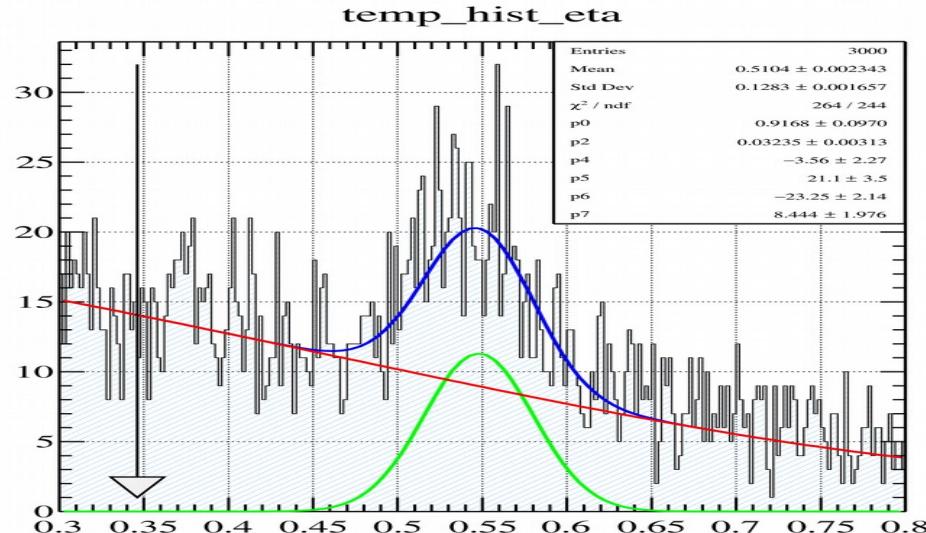


NN

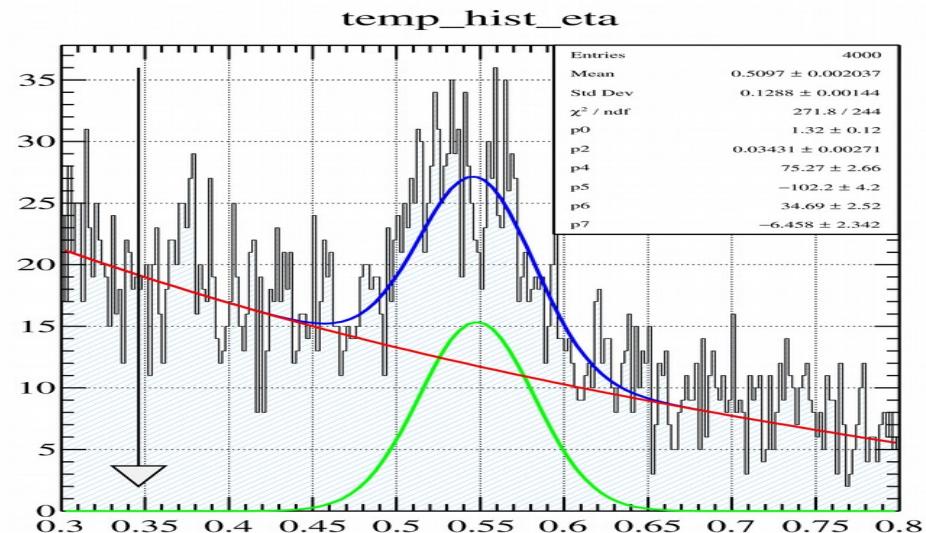
NN = 2K



NN = 3K

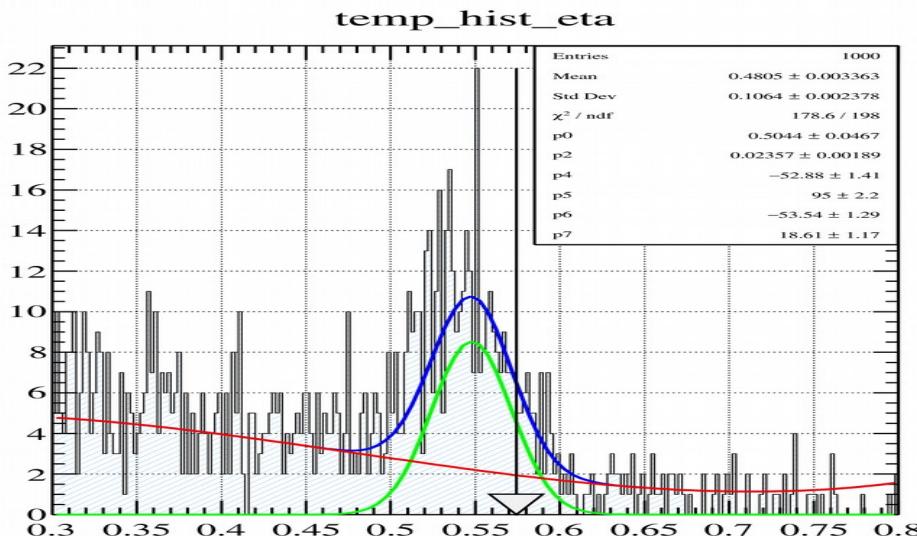


NN = 4K



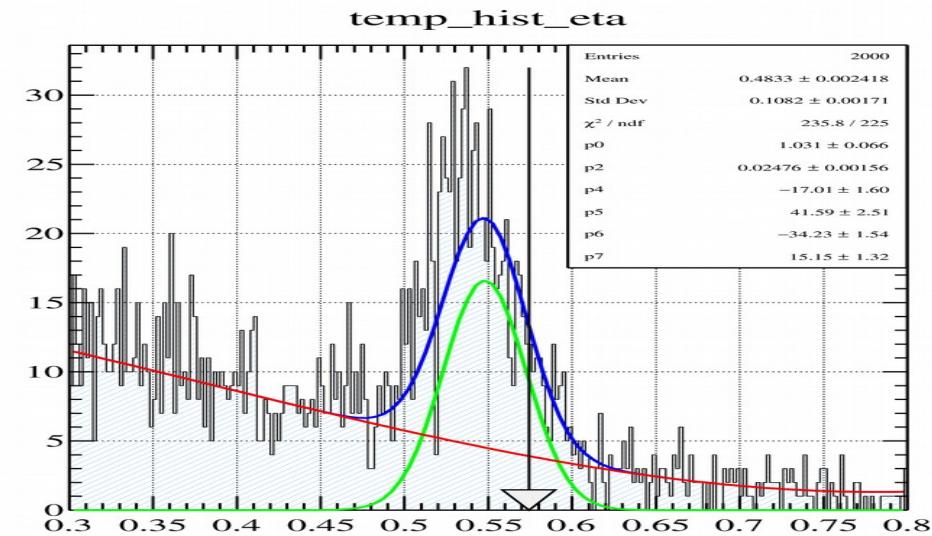
Example Fits (event5) for different Eta

NN = 1K

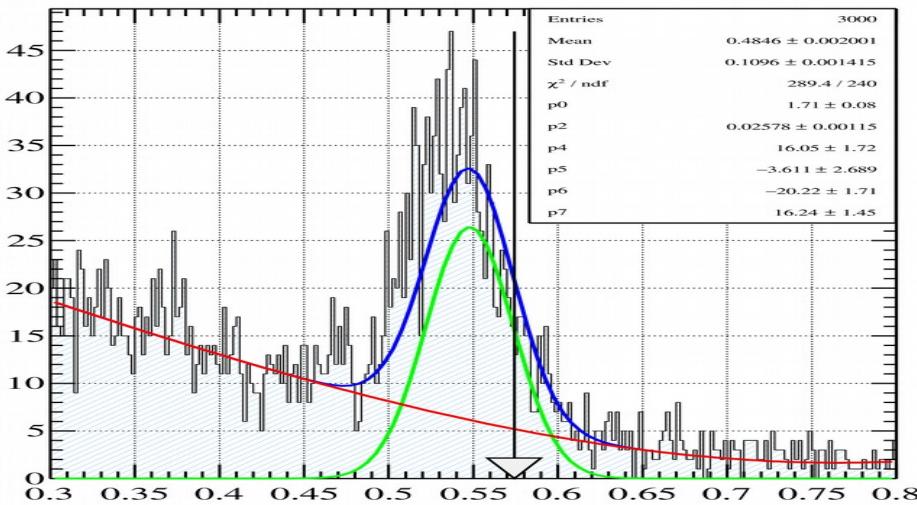


NN

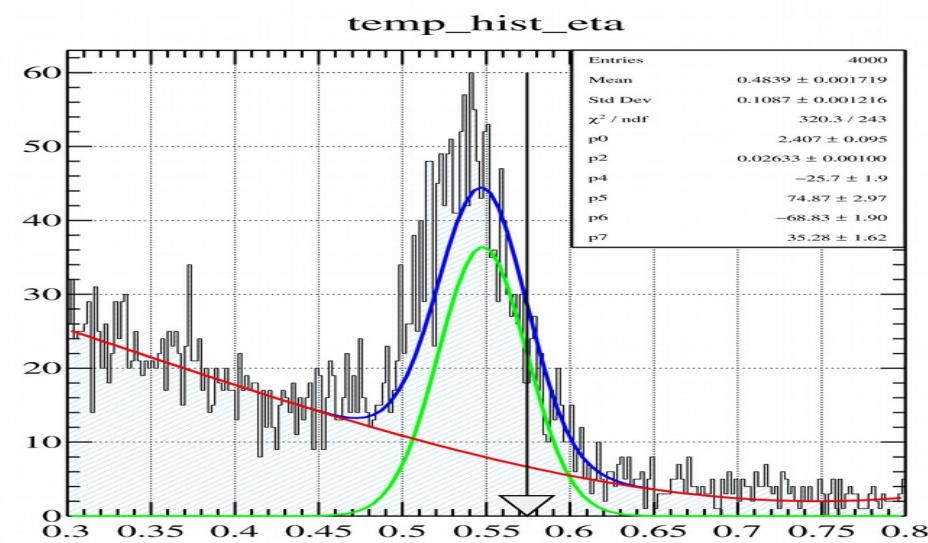
NN = 2K



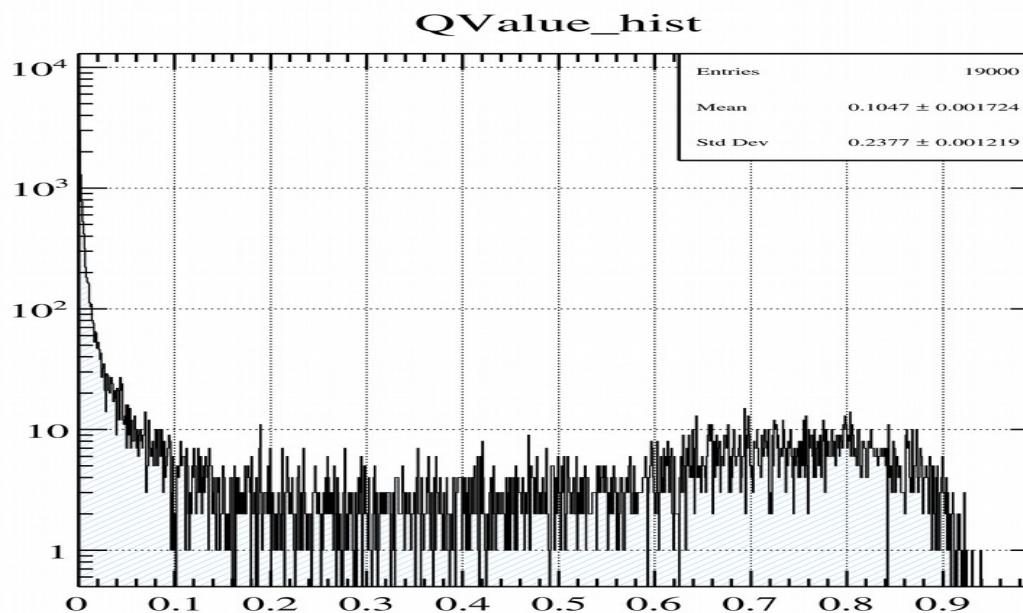
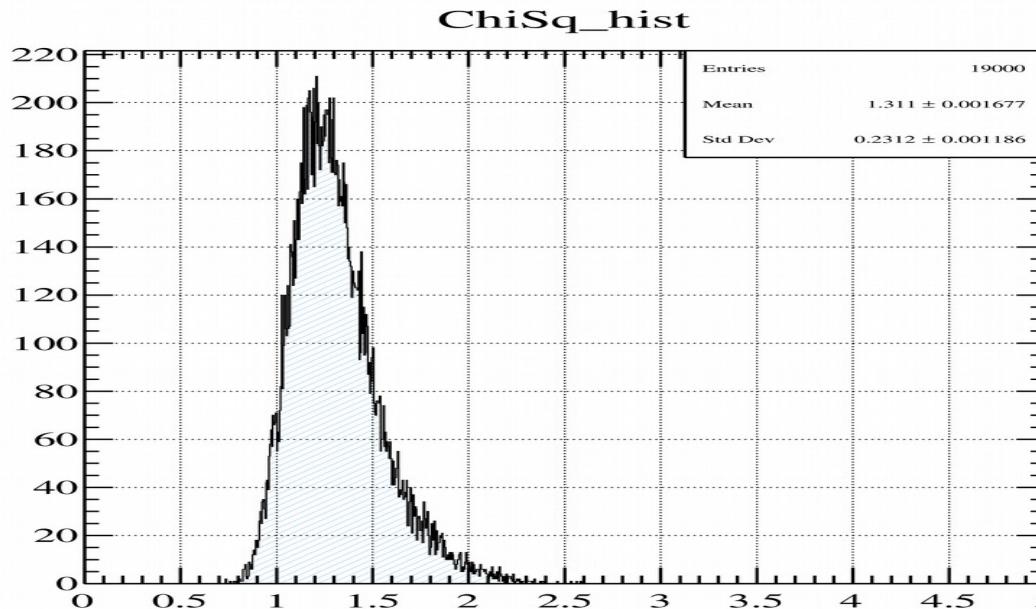
NN = 3K
temp_hist_eta



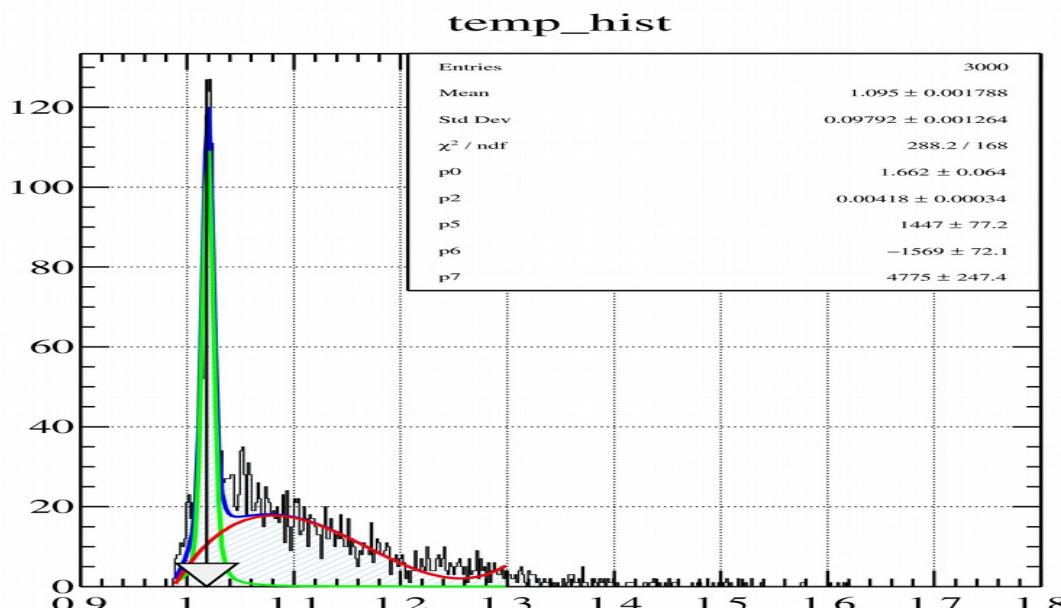
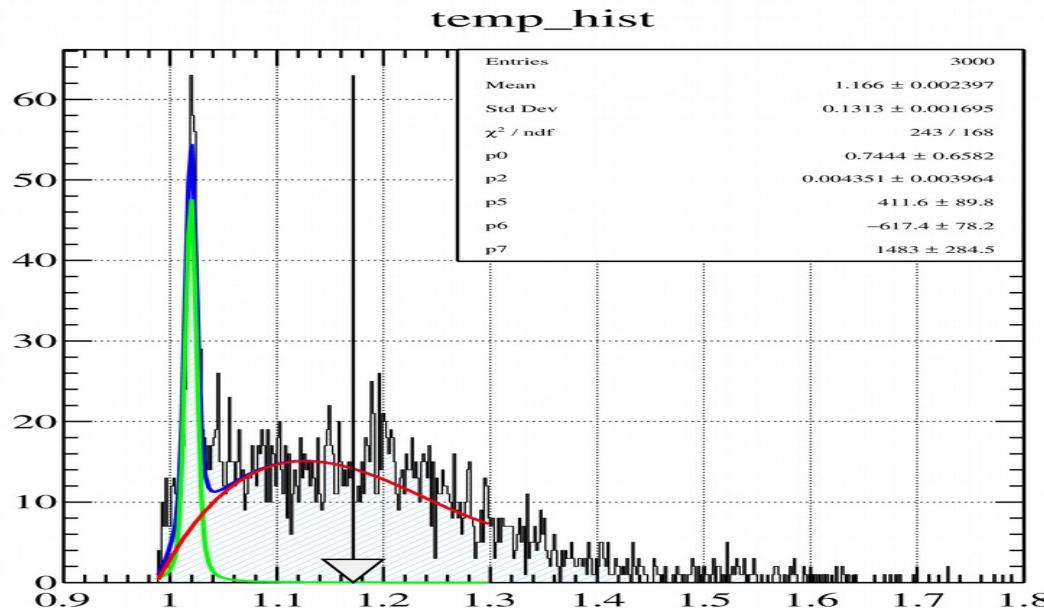
NN = 4K



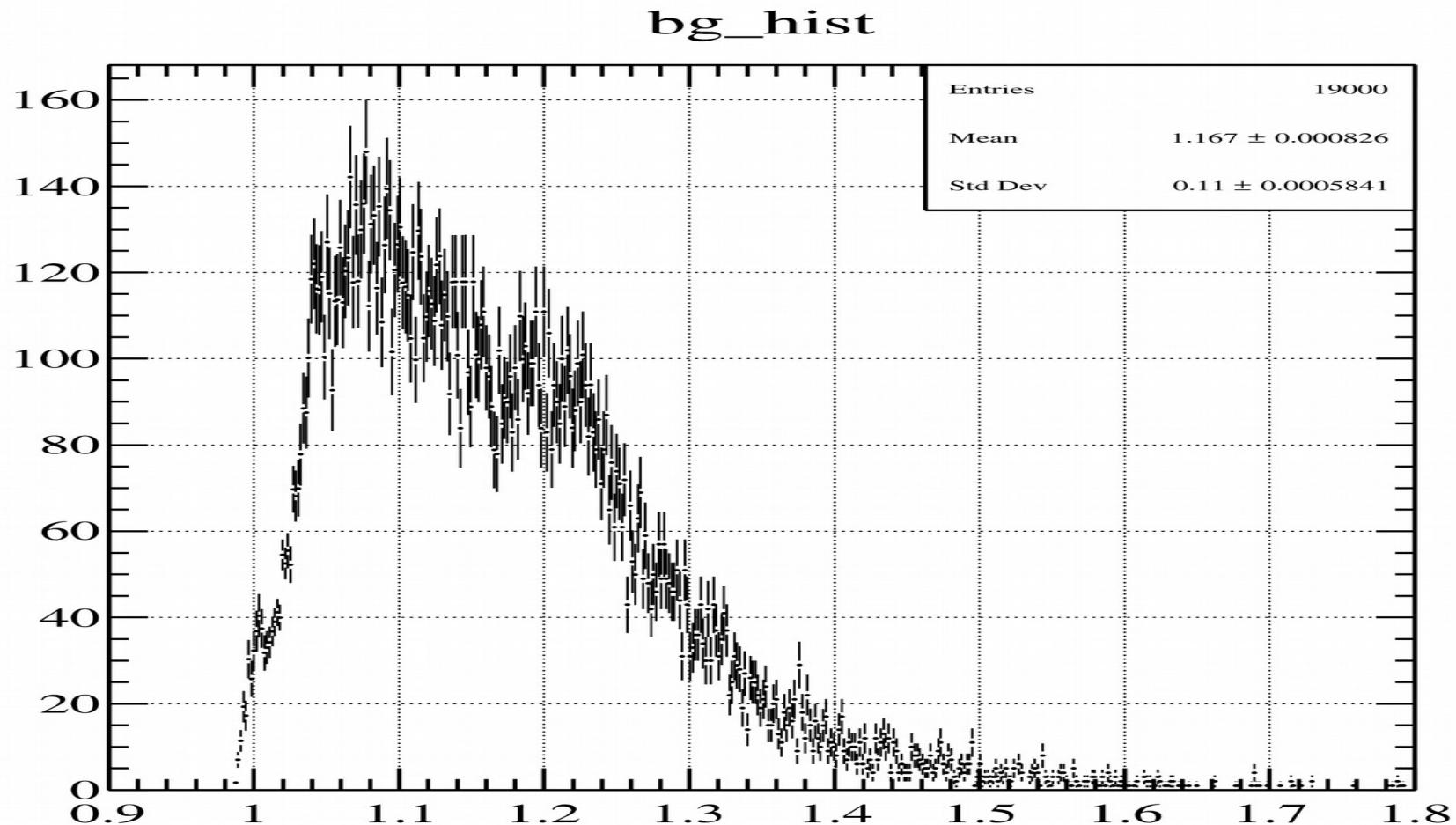
Chi² and Qvalue Distributions for Chebyshev Test (NN=3k)



Example Fits (event5 and event9) Chebyshev test

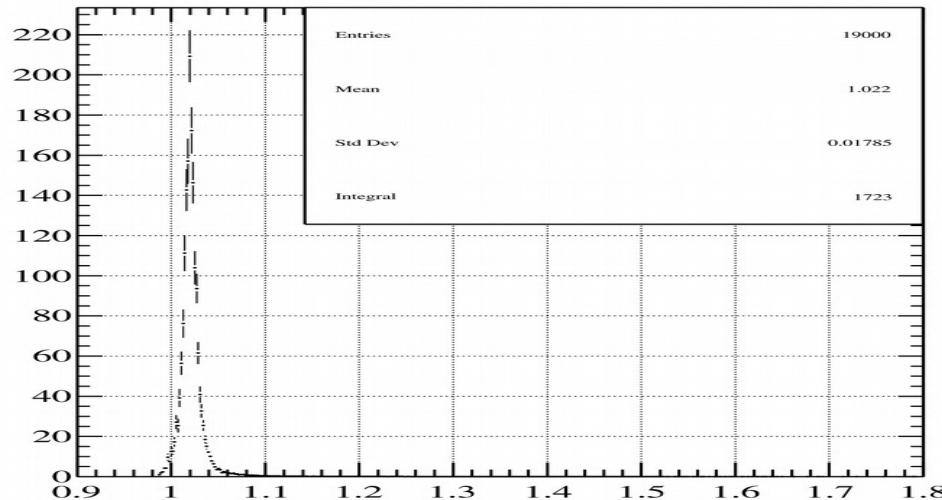


Qvalue Study Fitting: Chebyshev Test (w/ 3k NN)

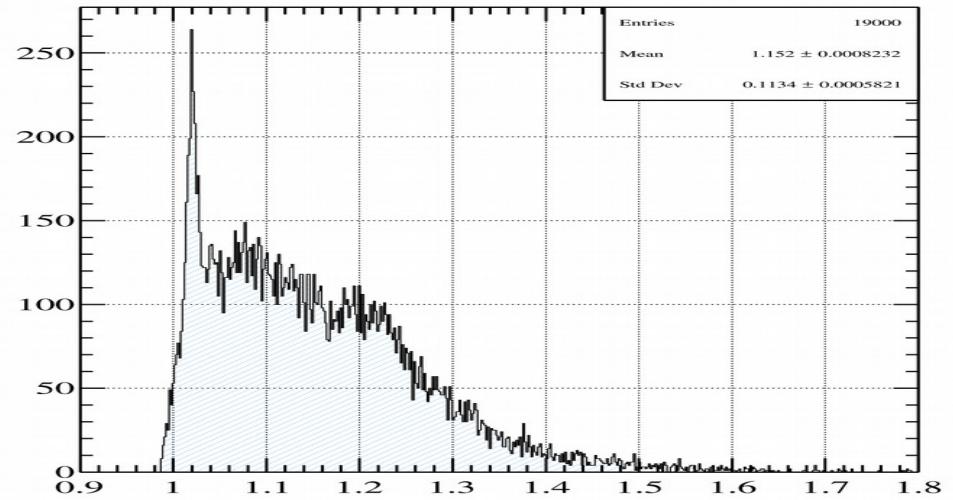


Qvalue Study Fitting: Phi (w/ 1k NN)

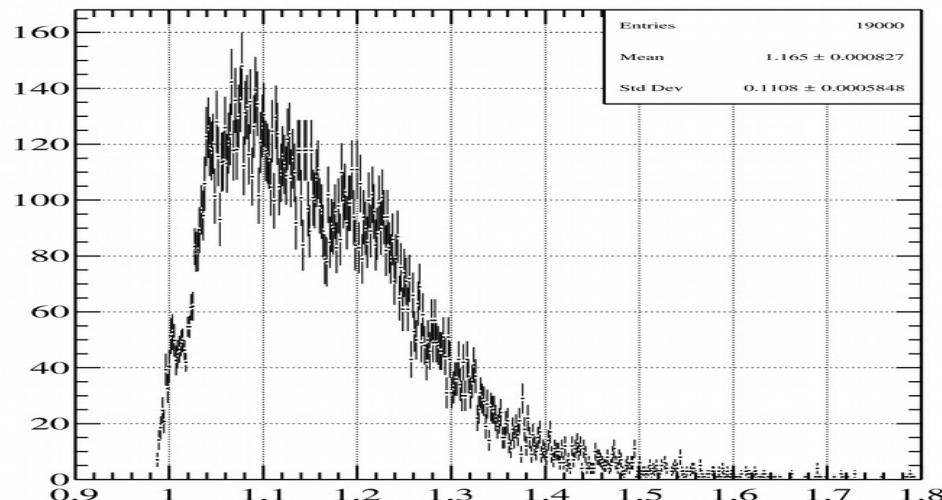
final_hist



init_hist

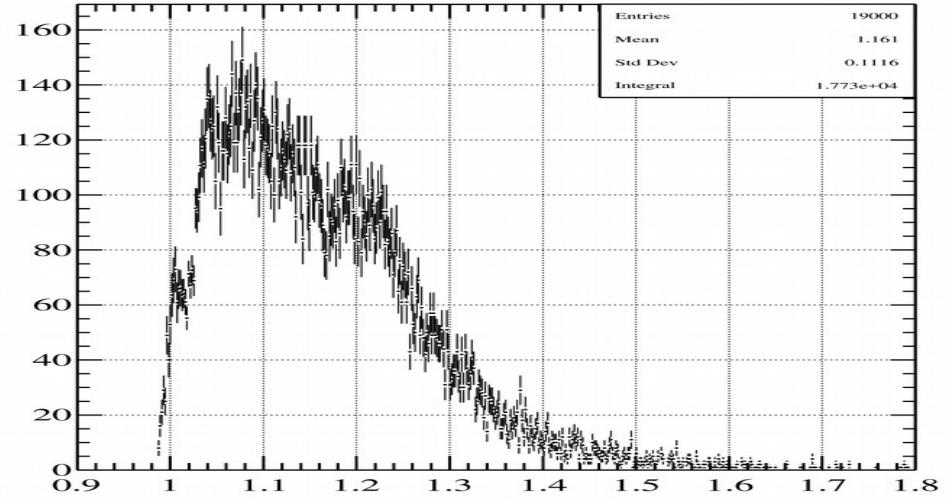


bg_hist

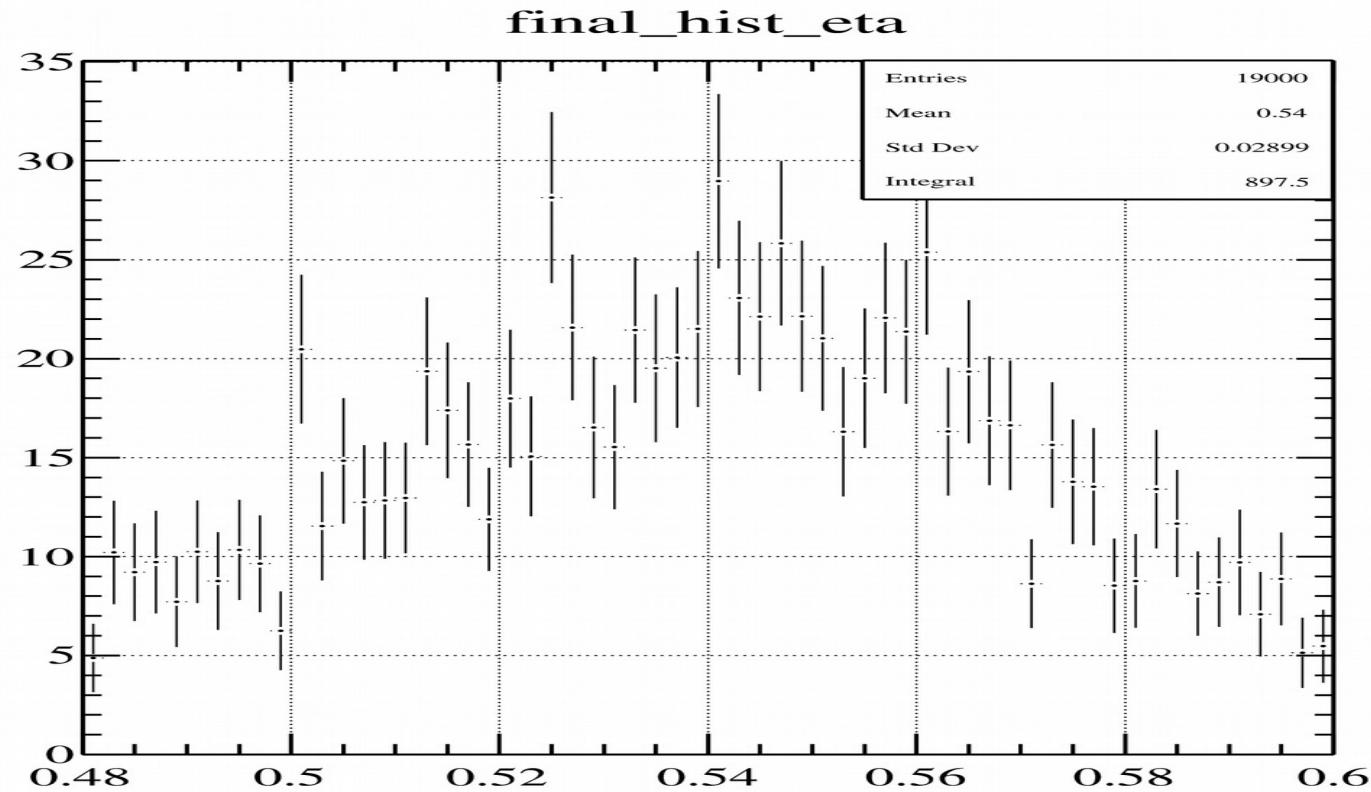


Old BG Hist

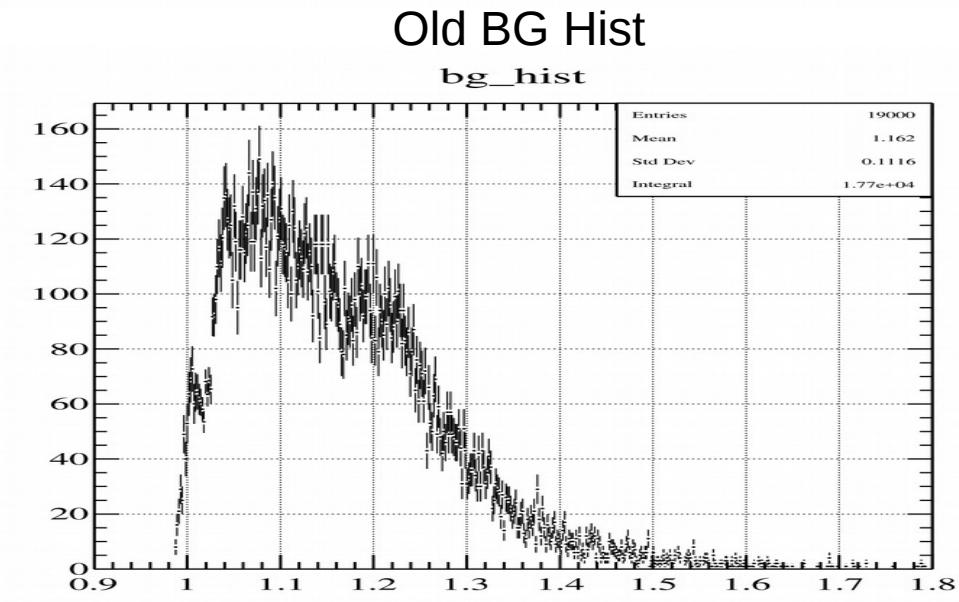
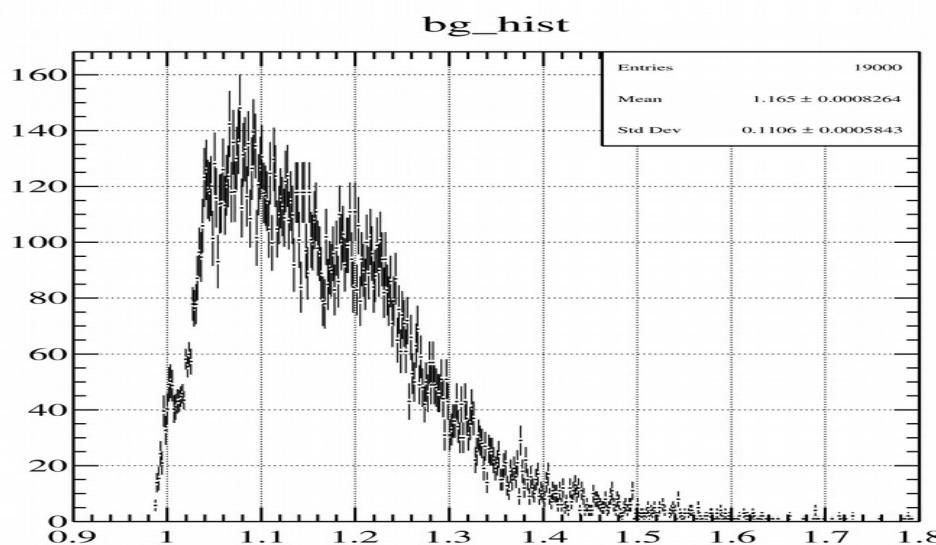
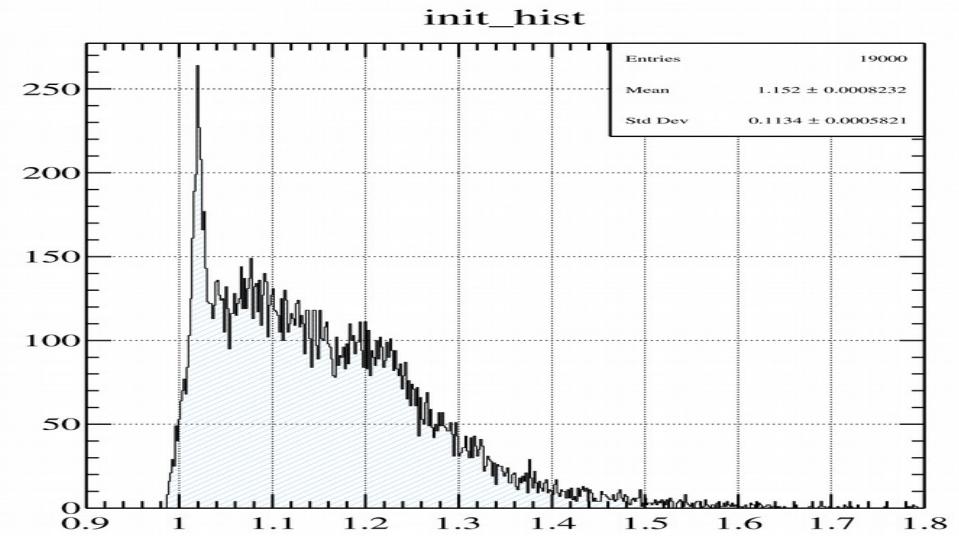
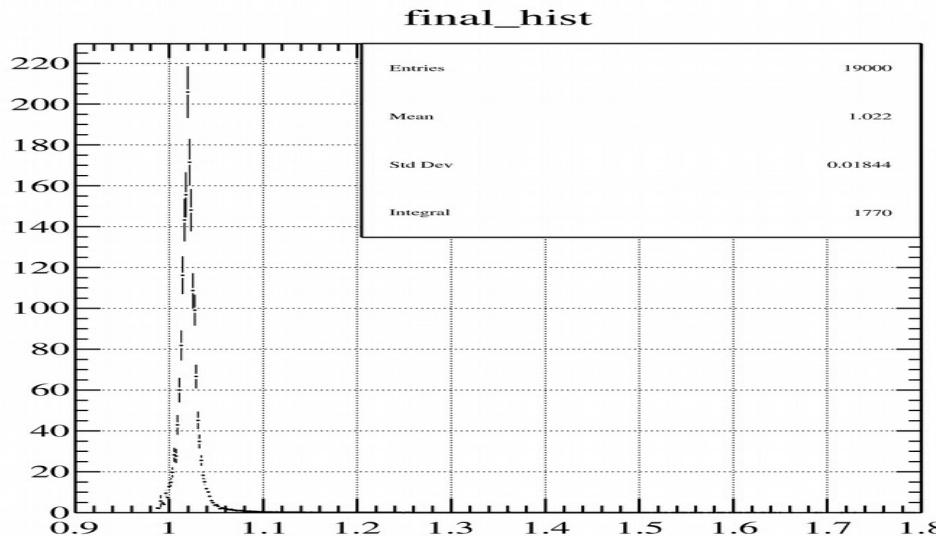
bg_hist



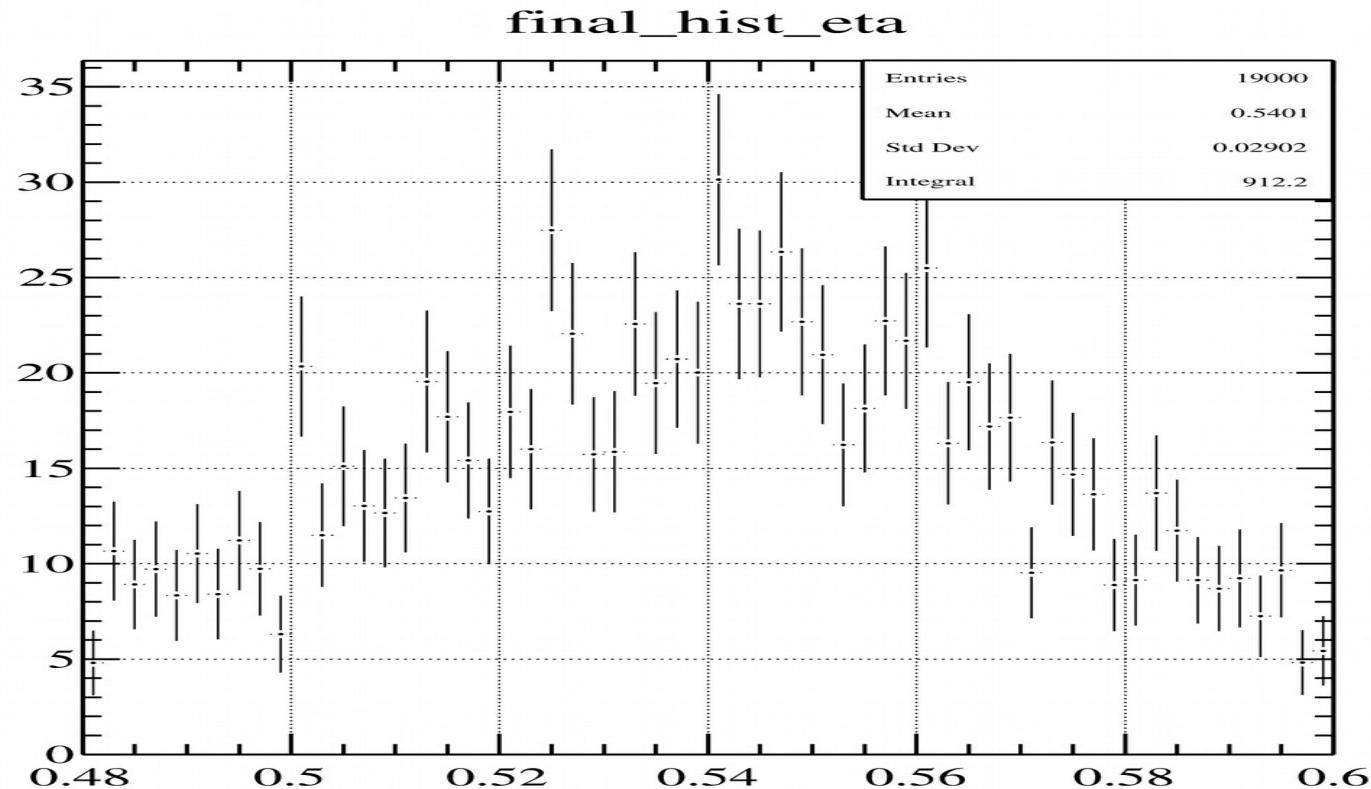
Qvalue Study Fitting: Phi (w/ 1k NN)



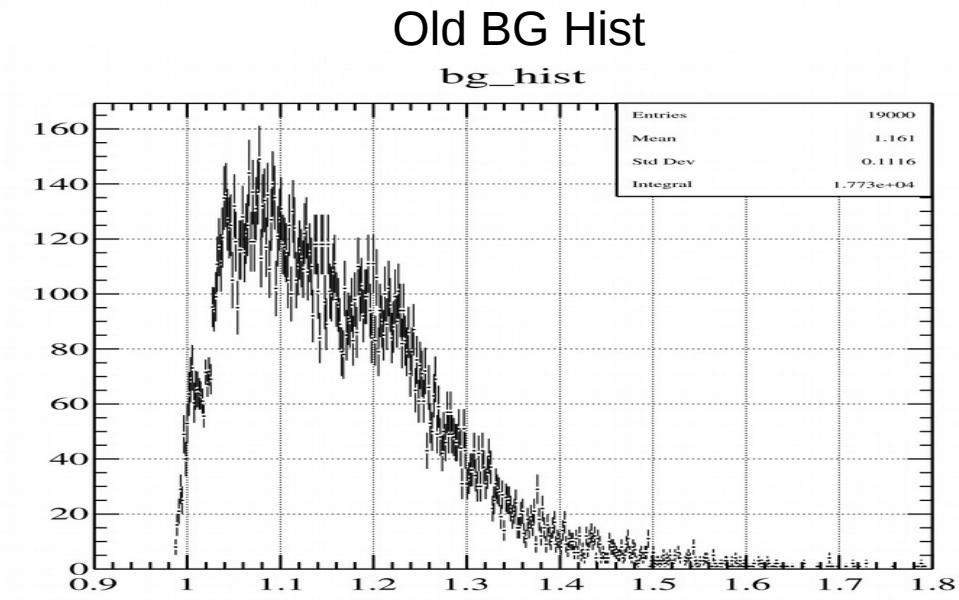
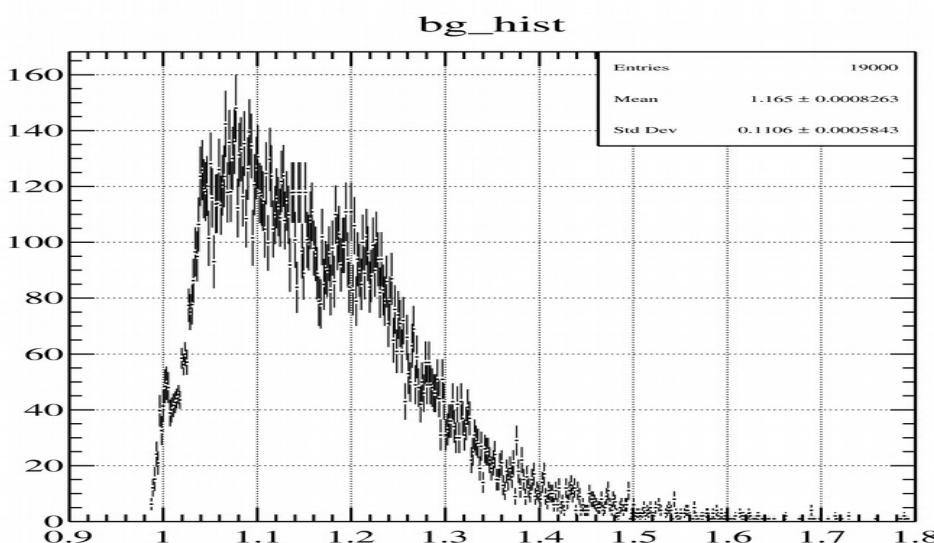
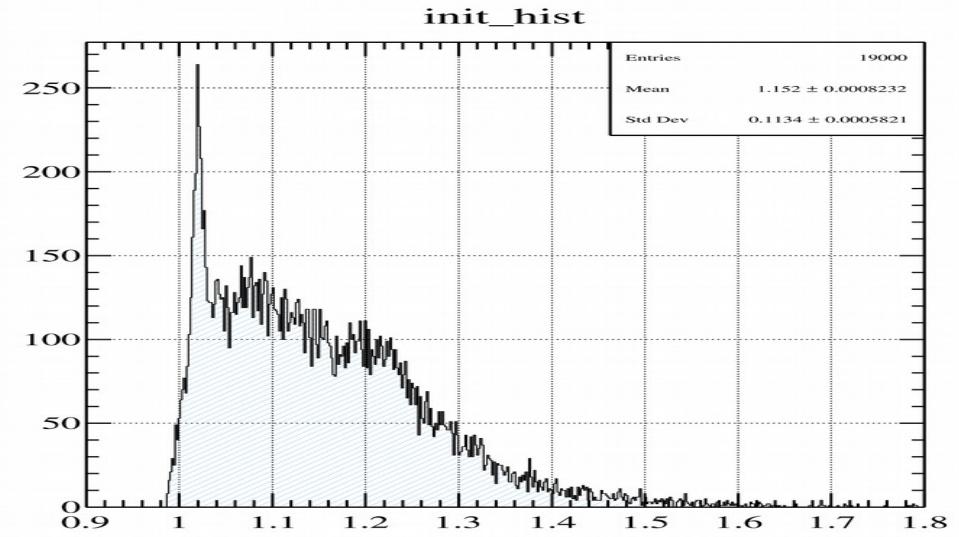
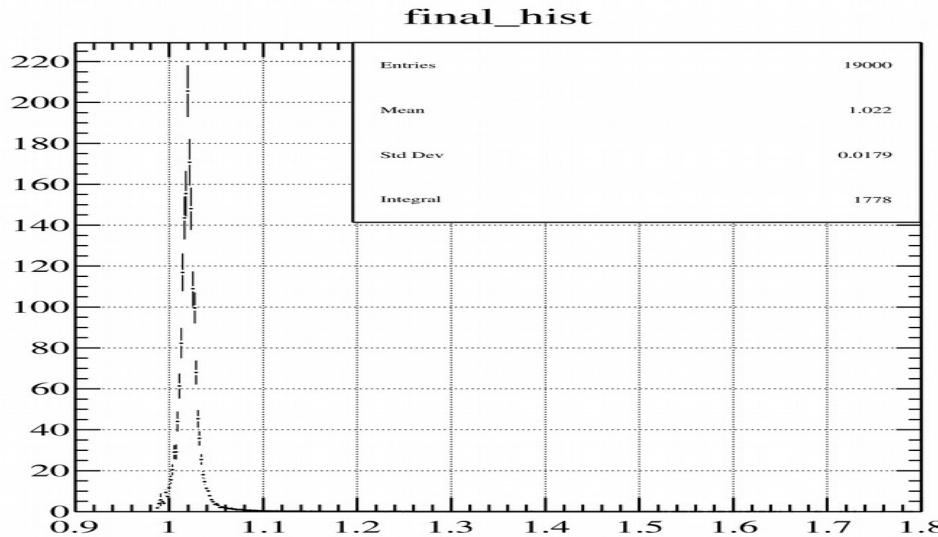
Qvalue Study Fitting: Phi (w/ 3k NN)



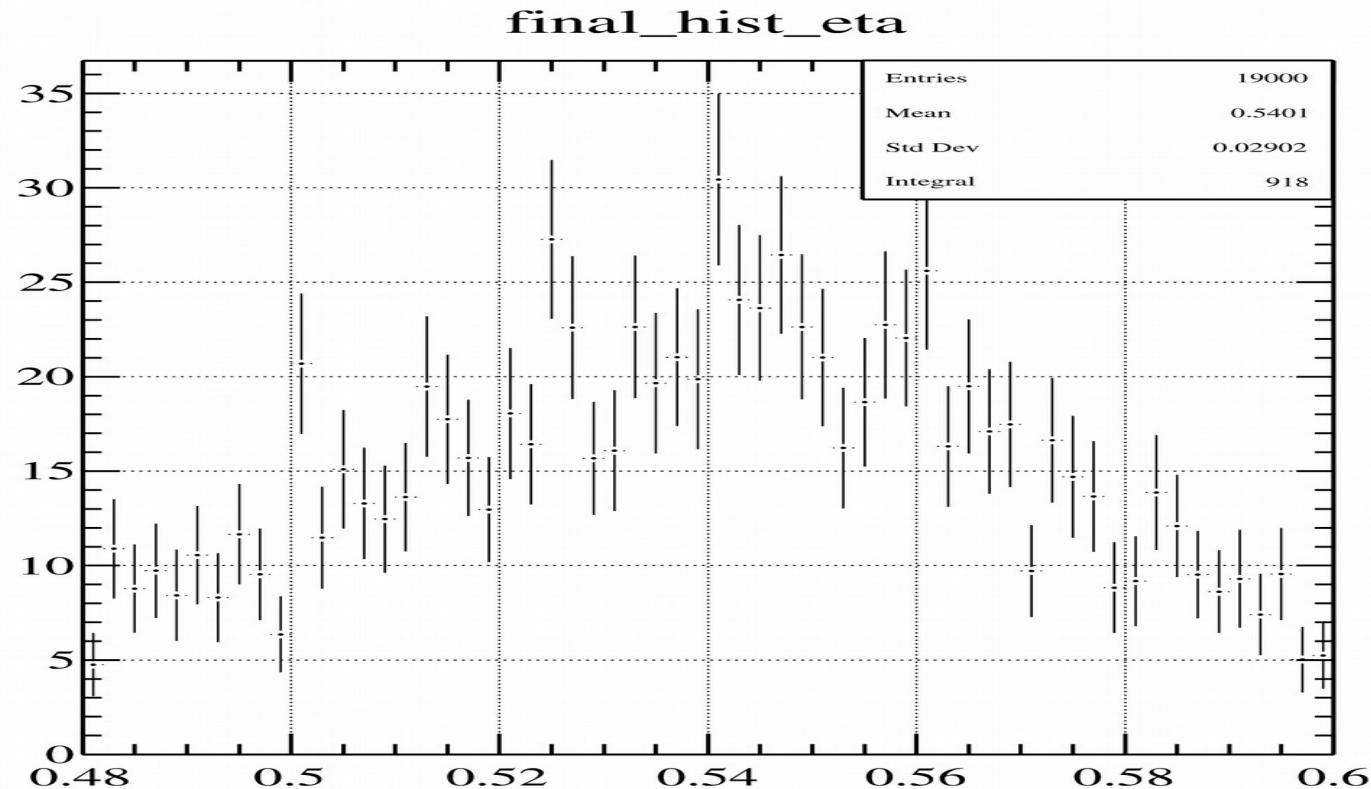
Qvalue Study Fitting: Phi (w/ 3k NN)



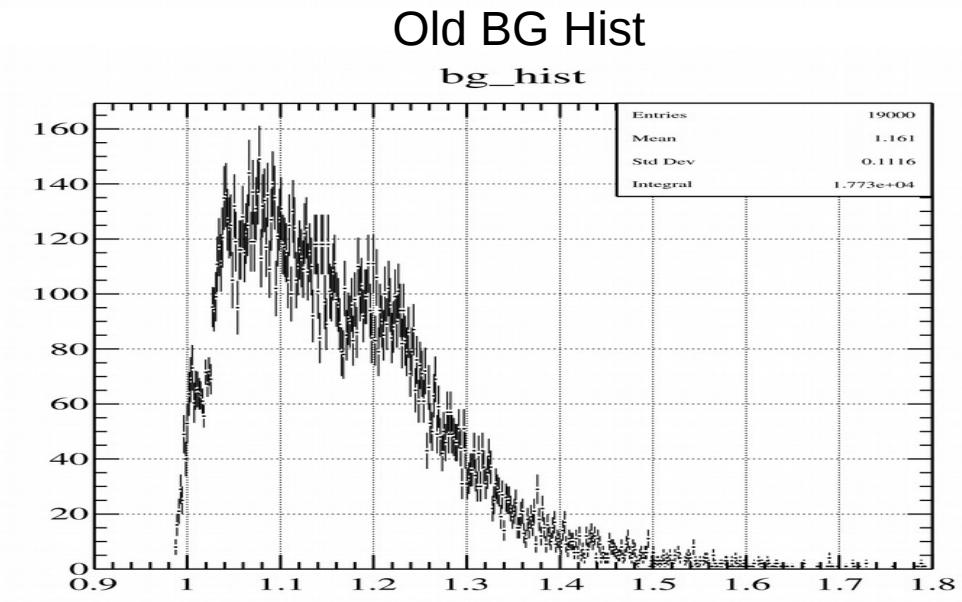
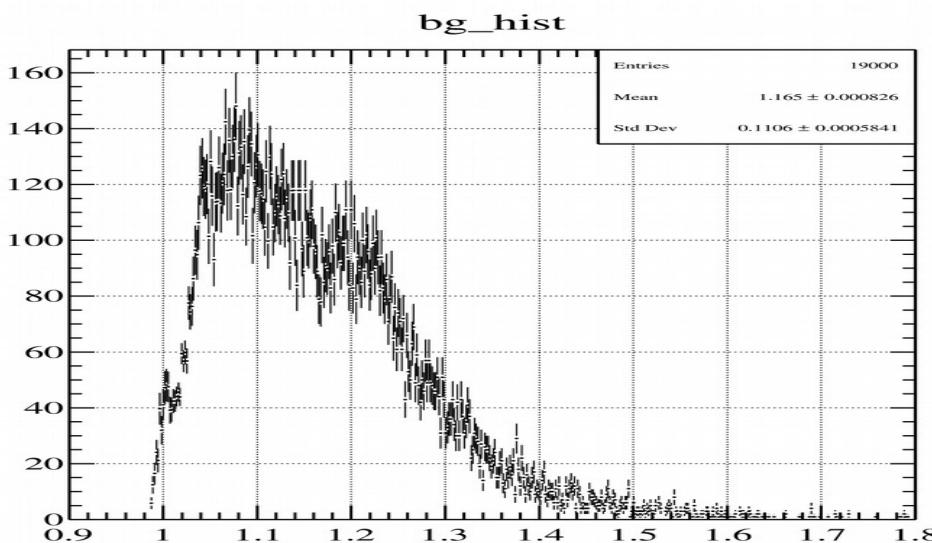
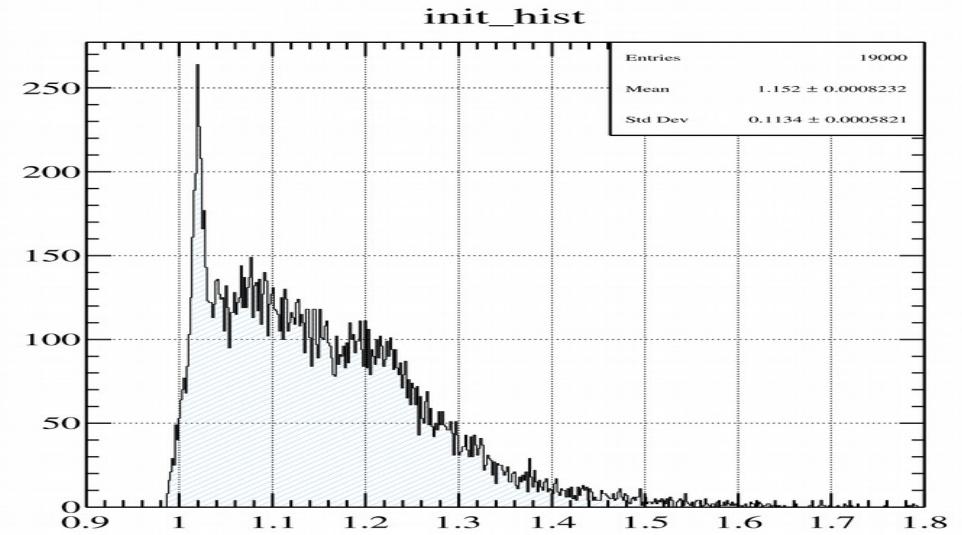
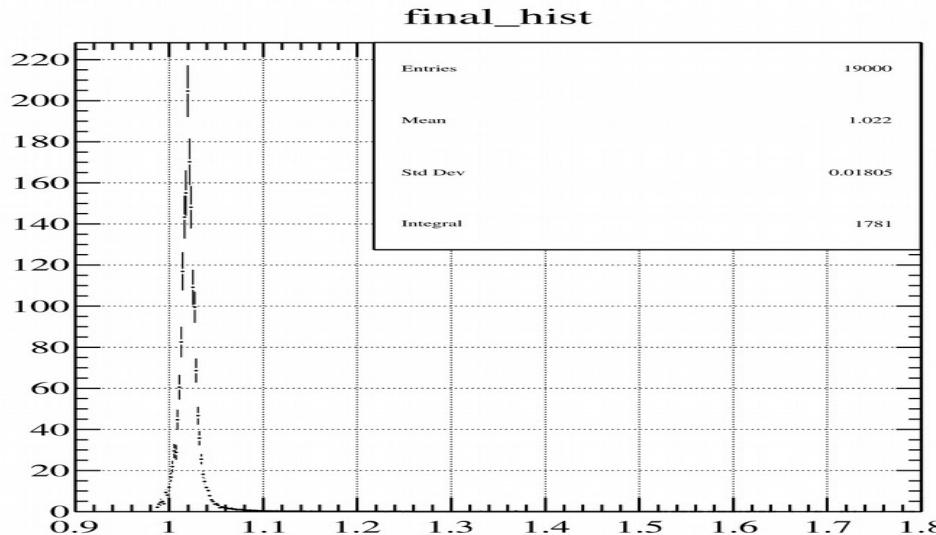
Qvalue Study Fitting: Phi (w/ 4k NN)



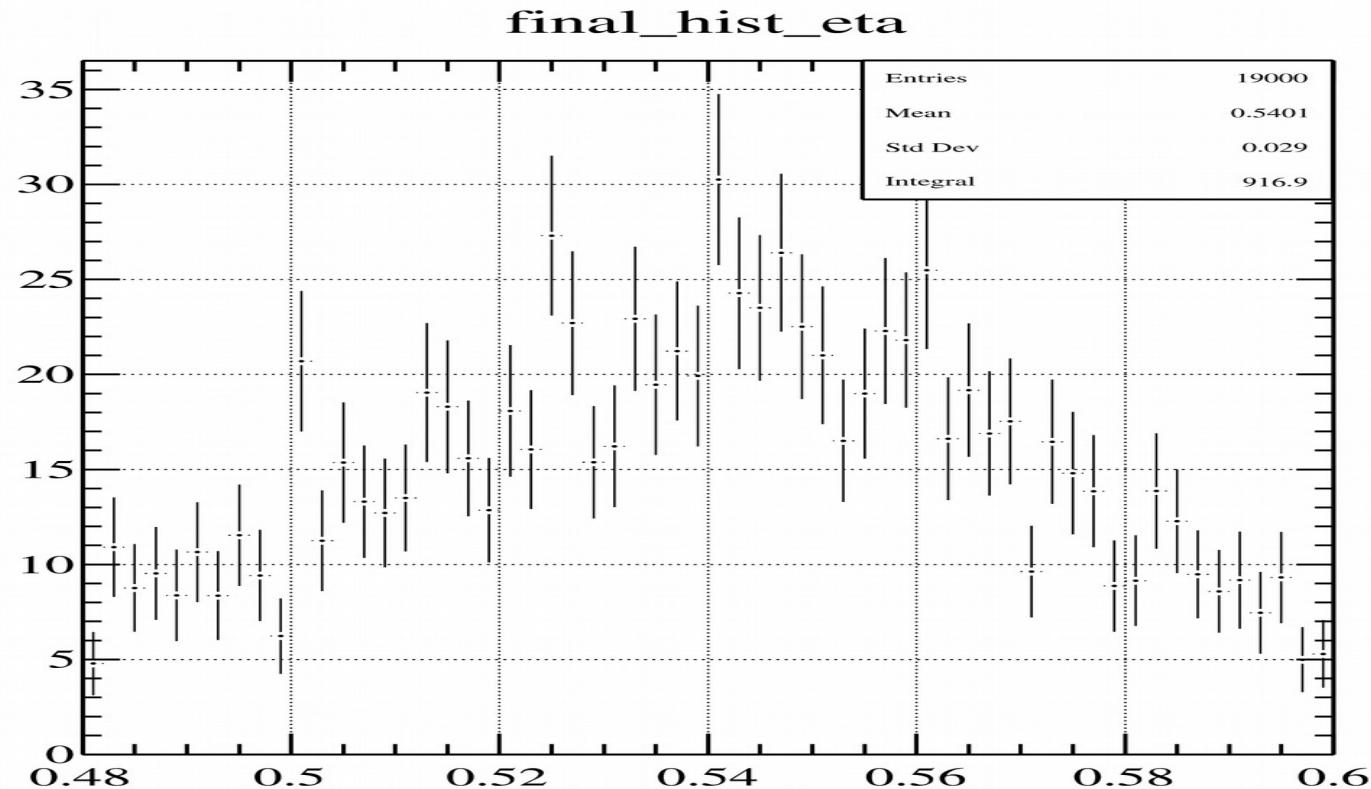
Qvalue Study Fitting: Phi (w/ 4k NN)



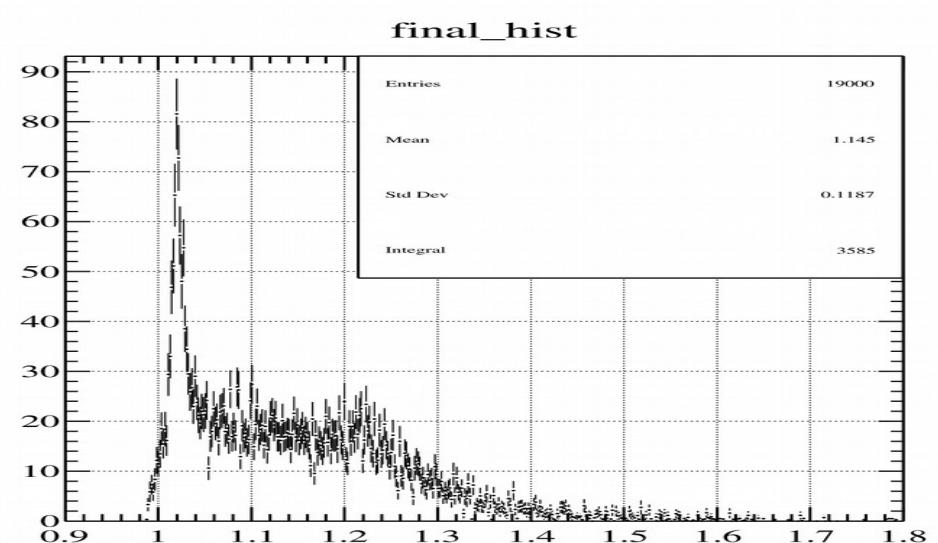
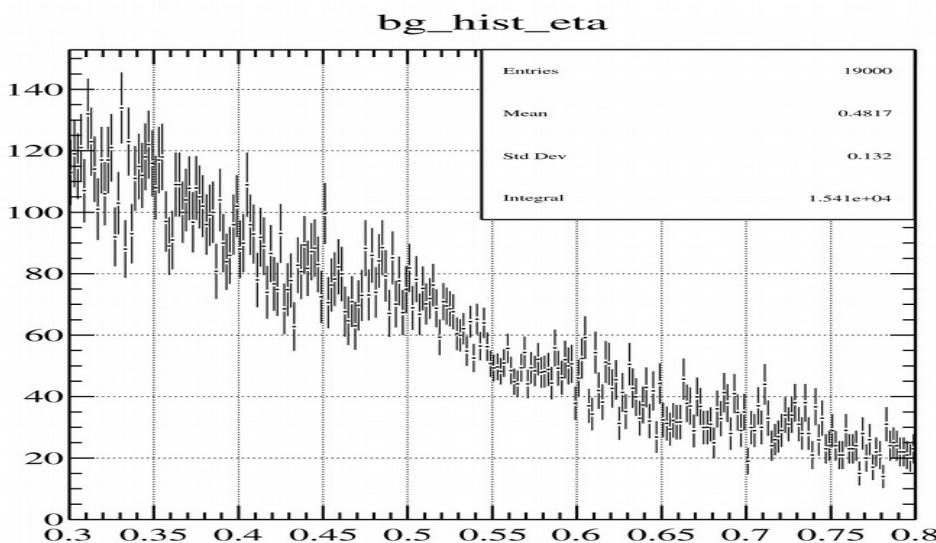
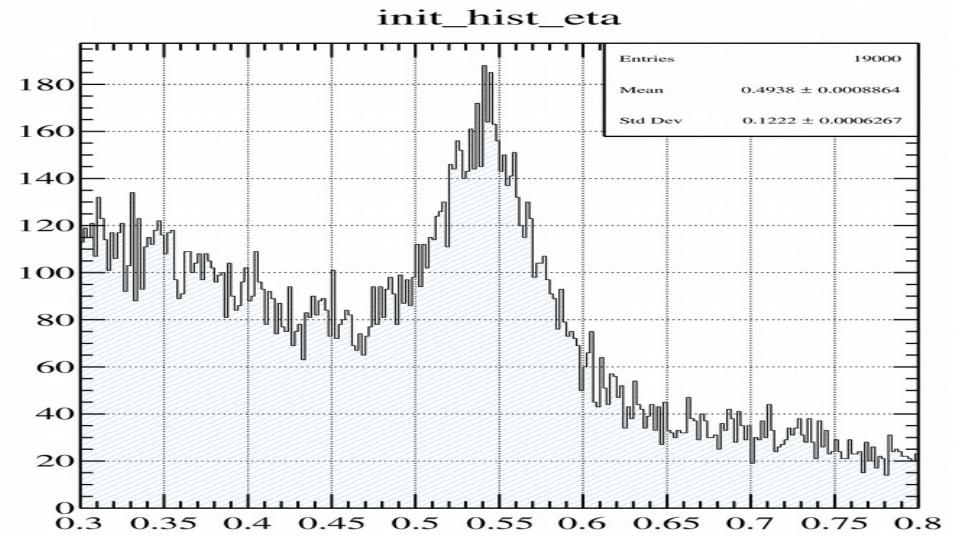
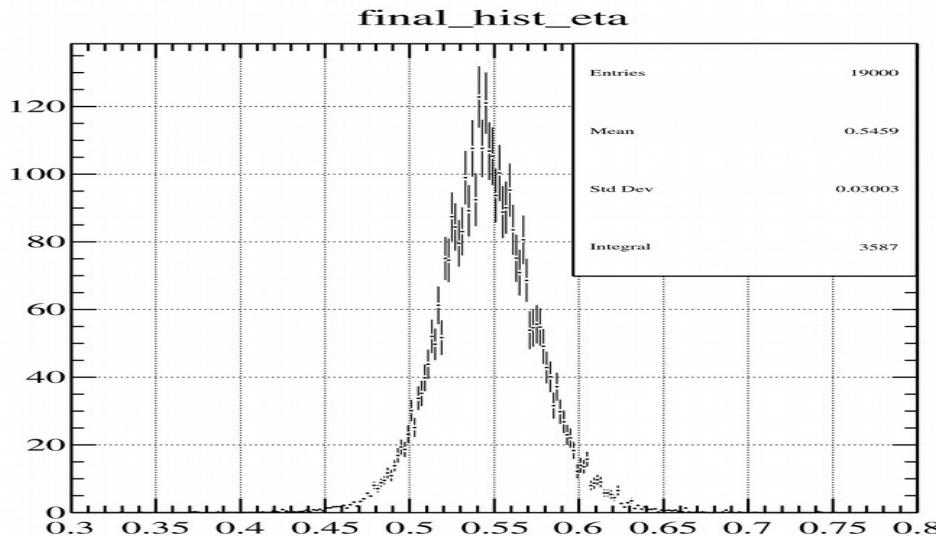
Qvalue Study Fitting: Phi (w/ 5k NN)



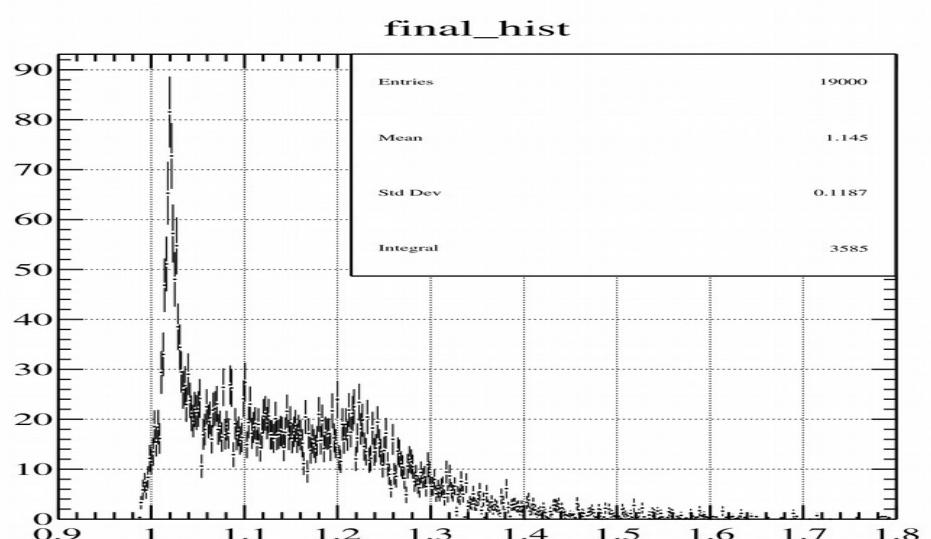
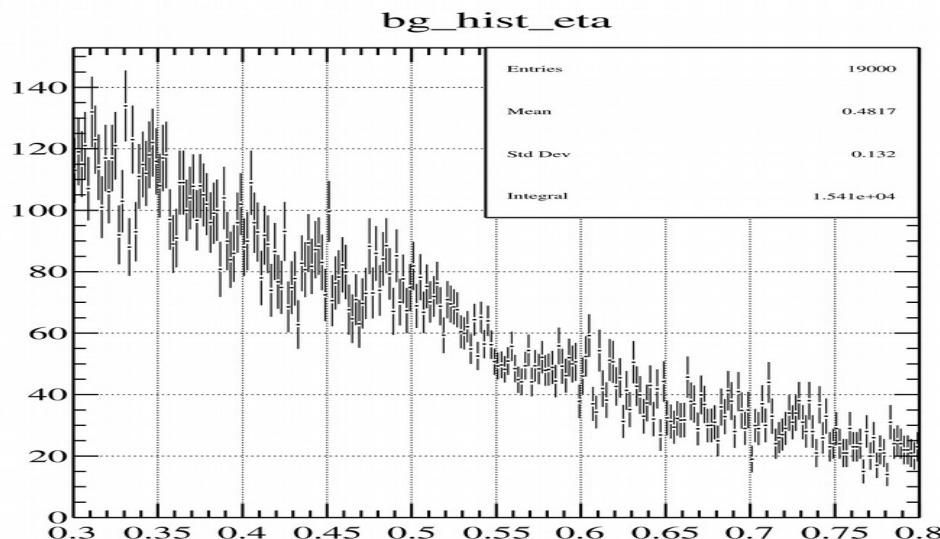
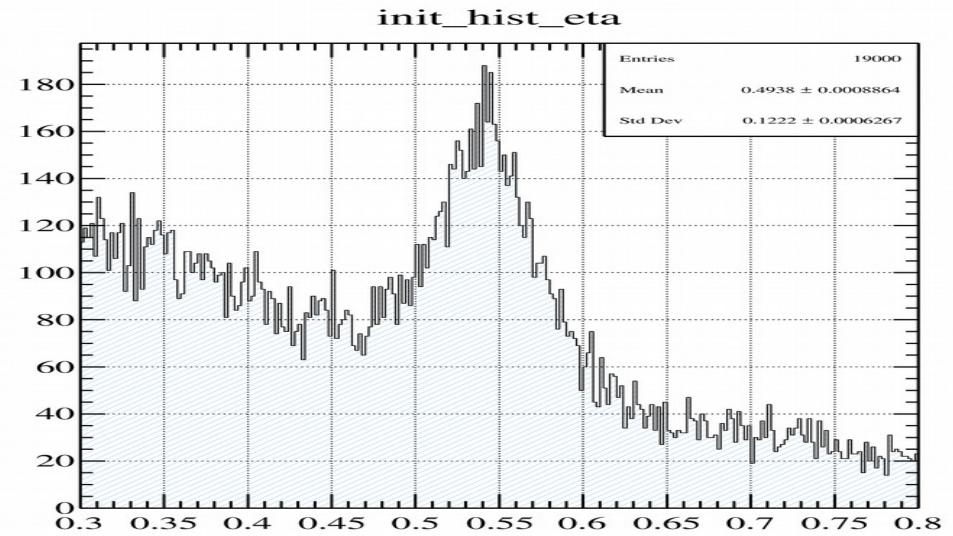
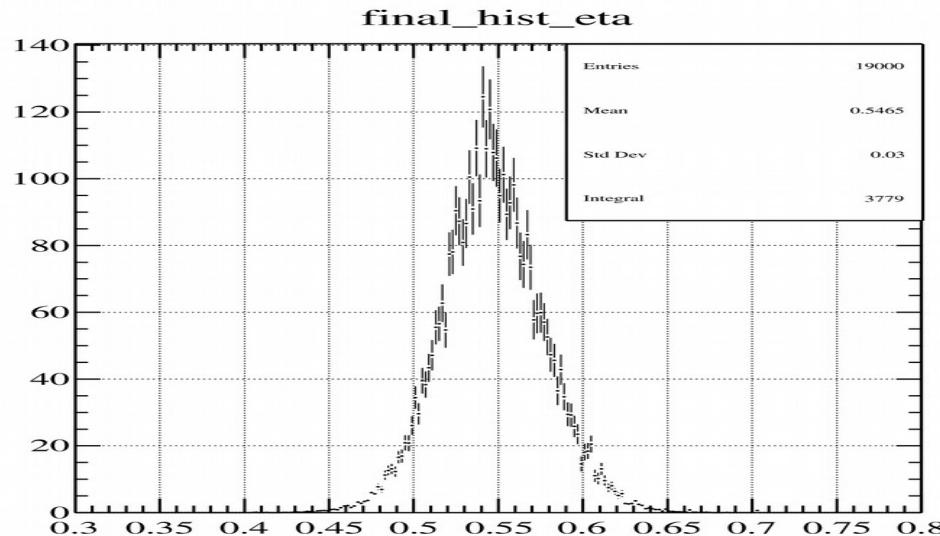
Qvalue Study Fitting: Phi (w/ 5k NN)



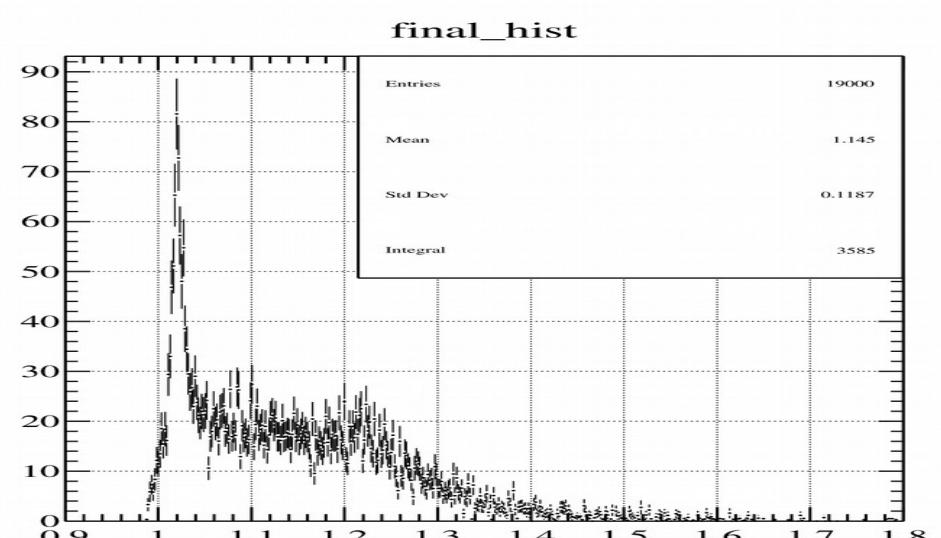
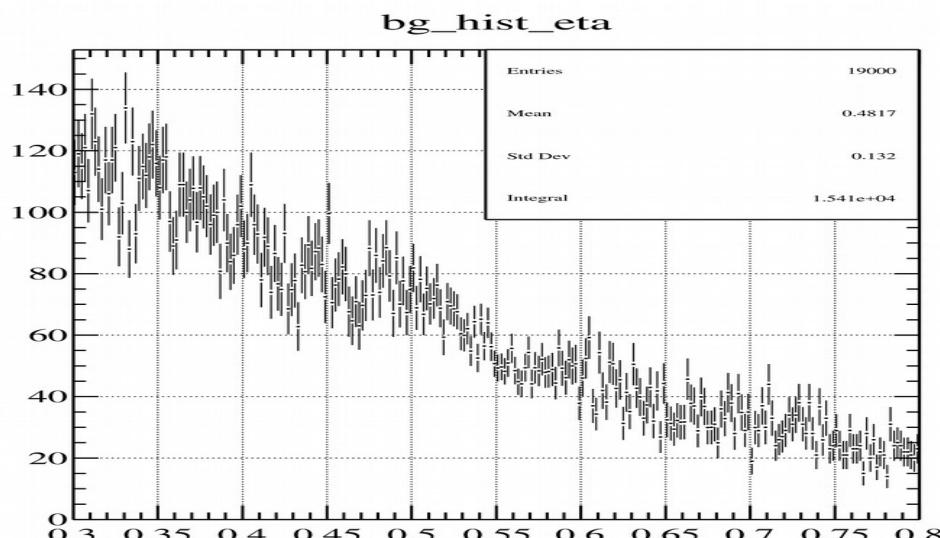
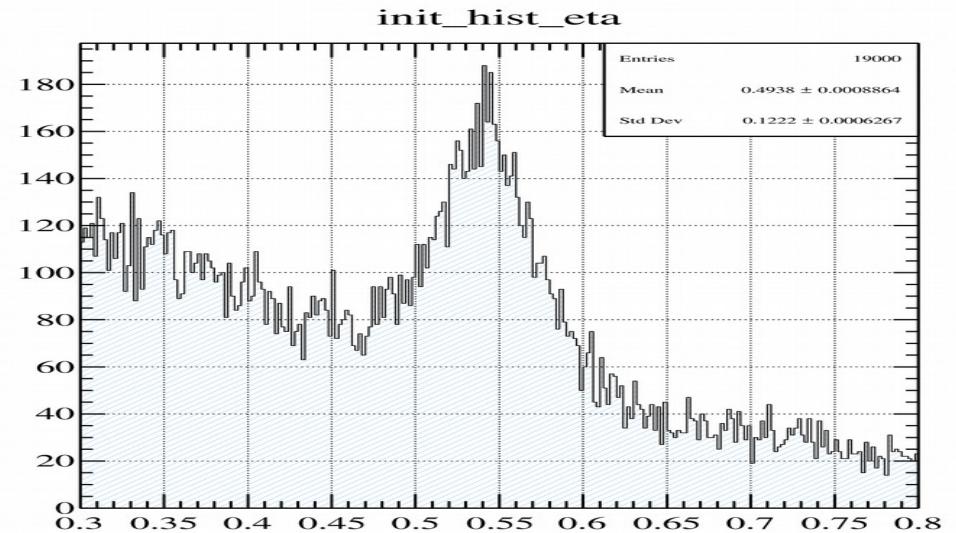
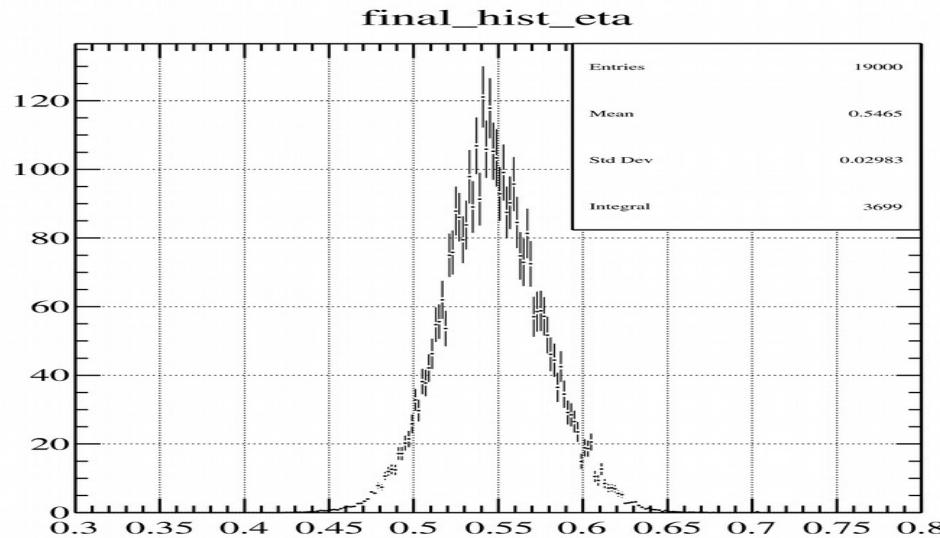
Qvalue Study Fitting: Eta (w/ 1k NN)



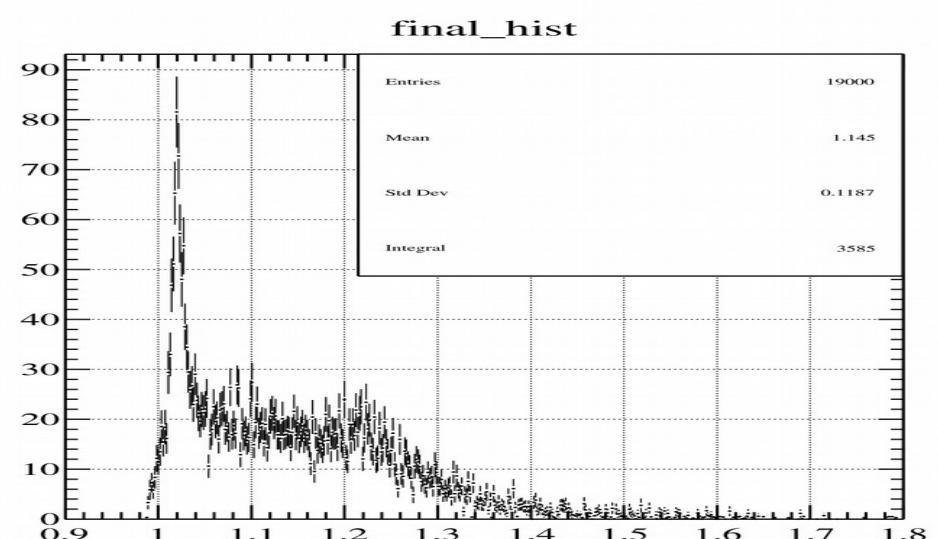
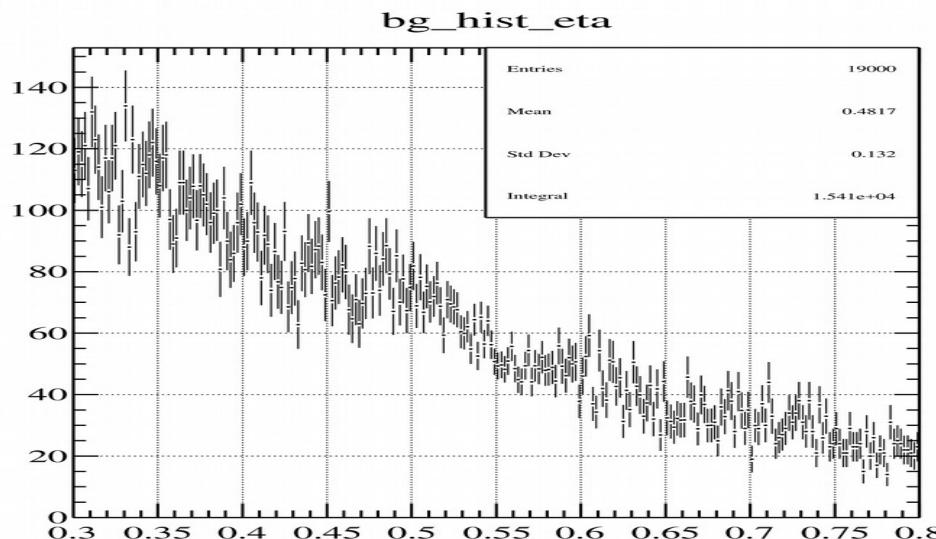
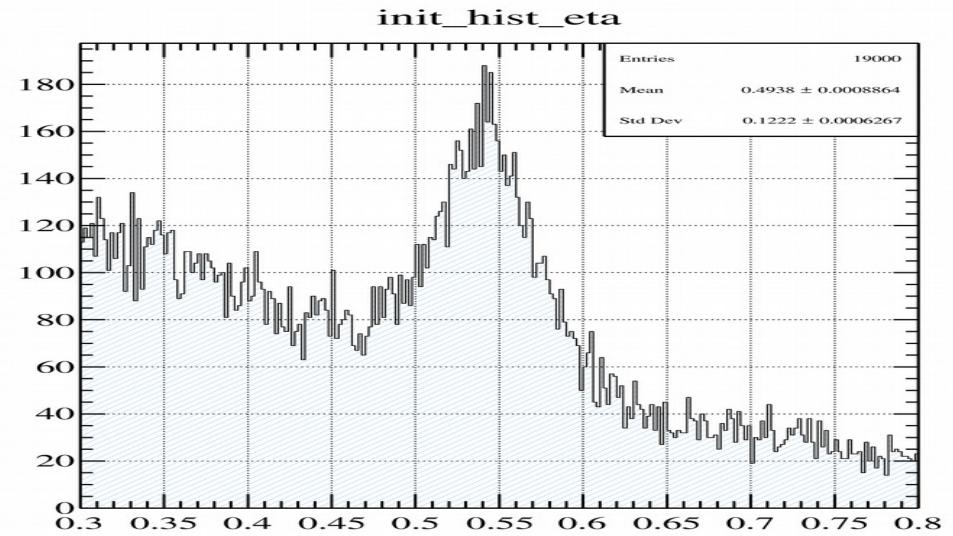
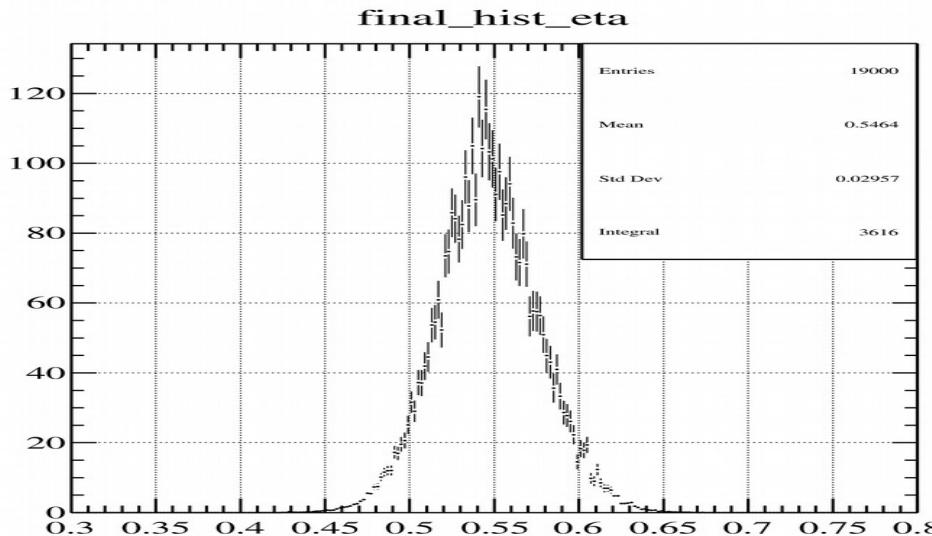
Qvalue Study Fitting: Eta (w/ 2k NN)



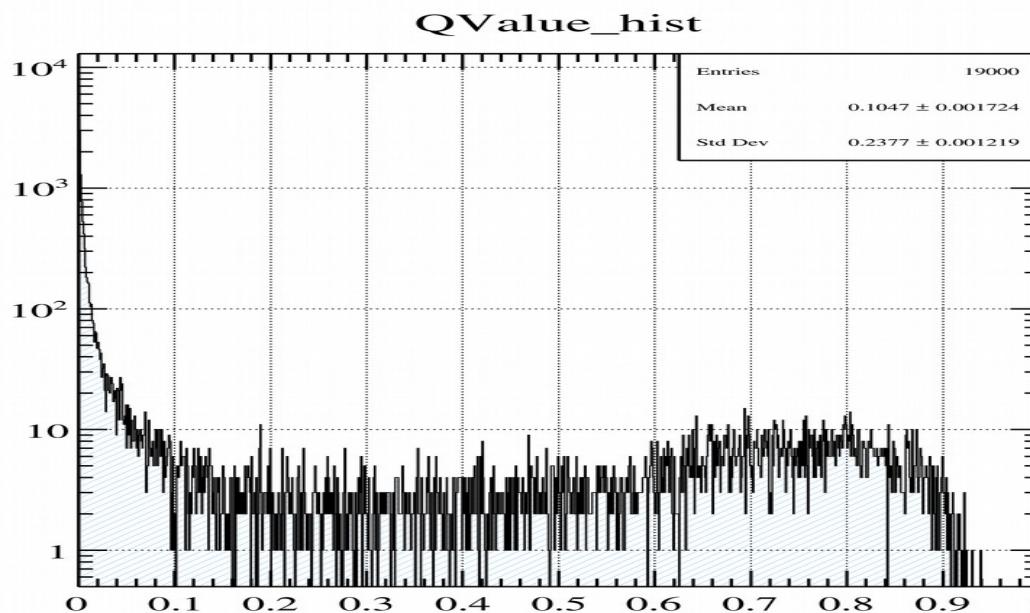
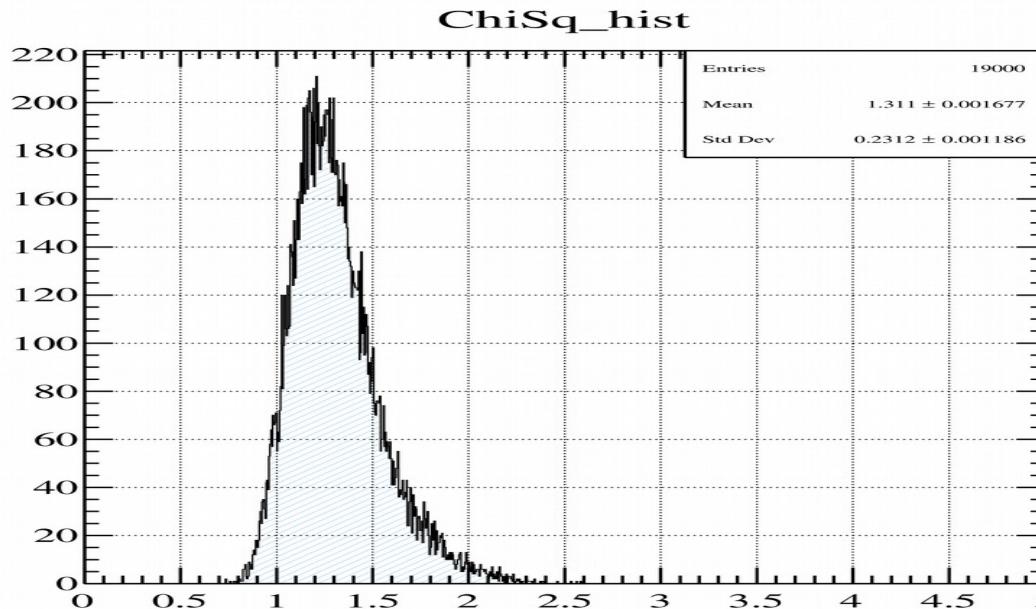
Qvalue Study Fitting: Eta (w/ 3k NN)



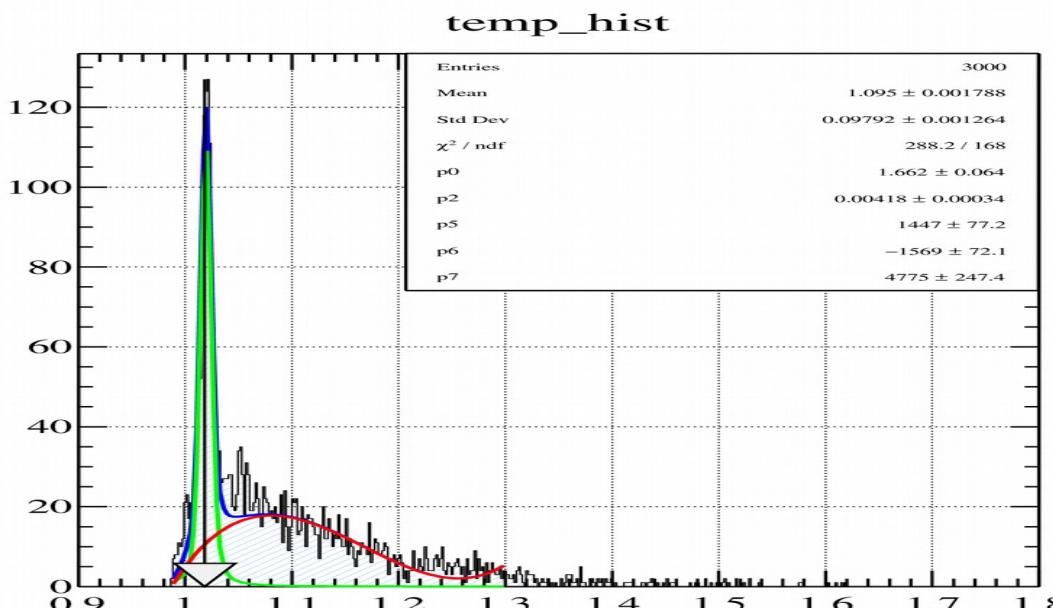
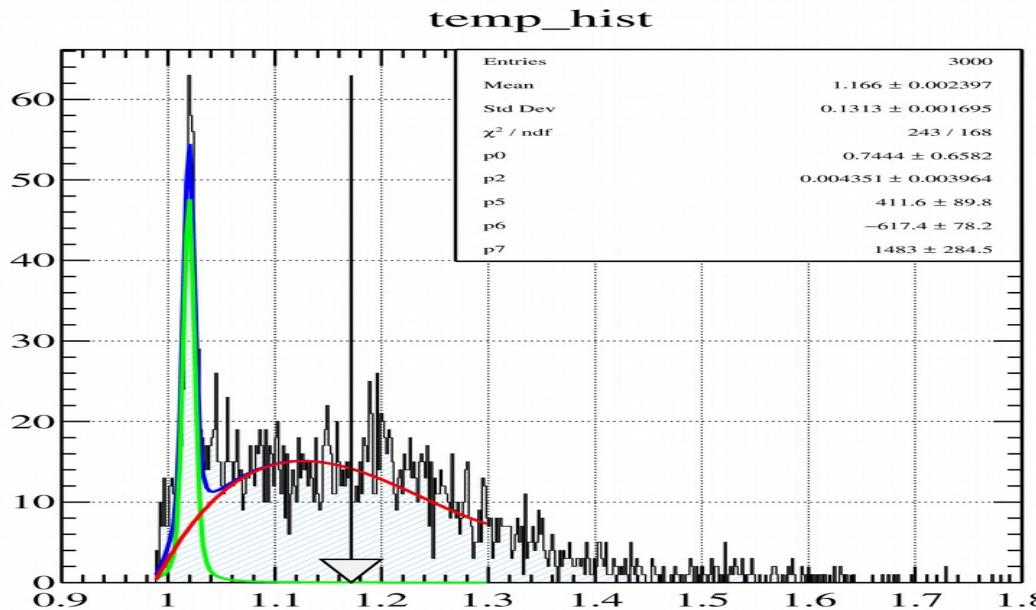
Qvalue Study Fitting: Eta (w/ 4k NN)



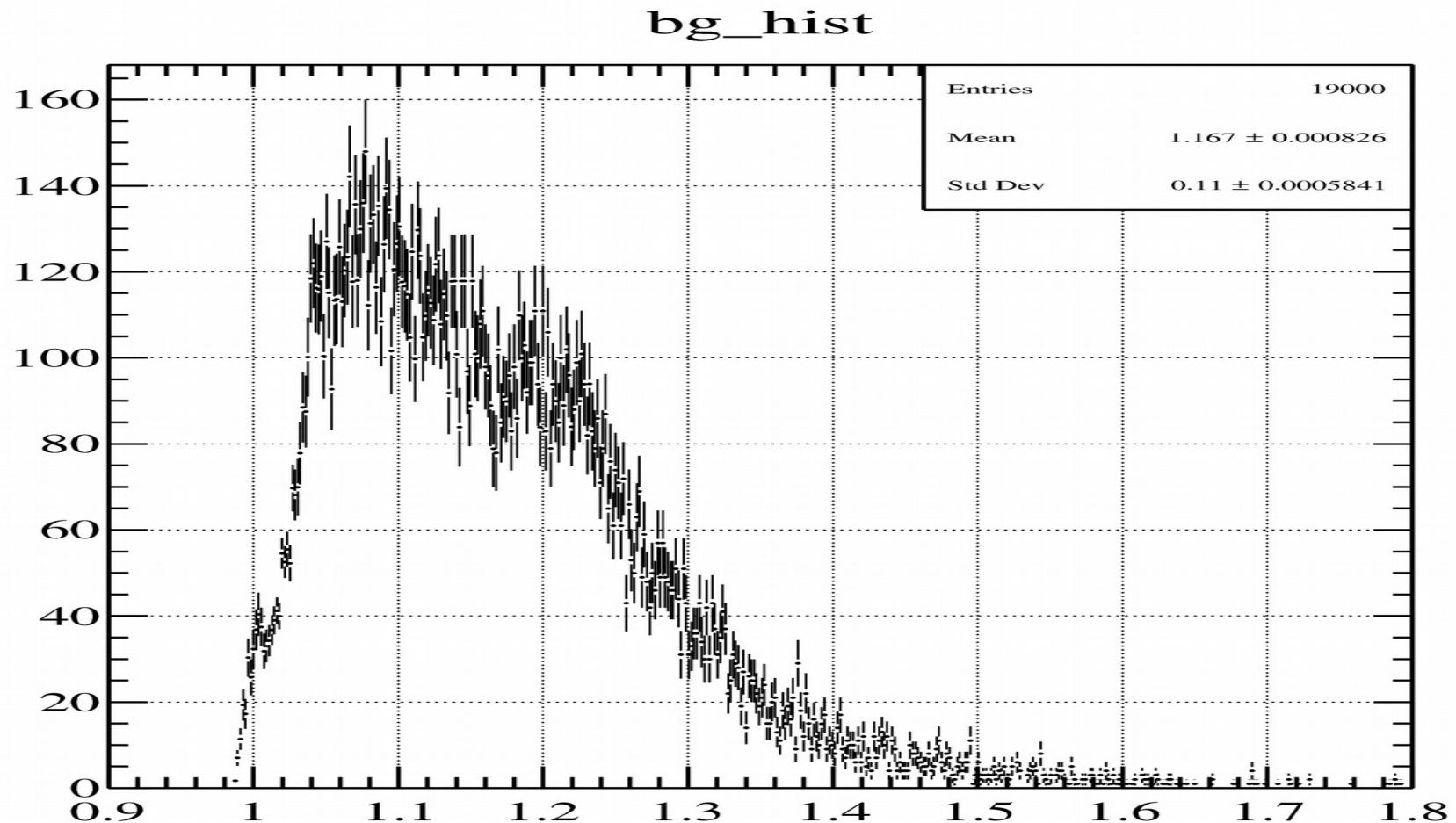
Chi² and Qvalue Distributions for Chebyshev Test (NN=3k)



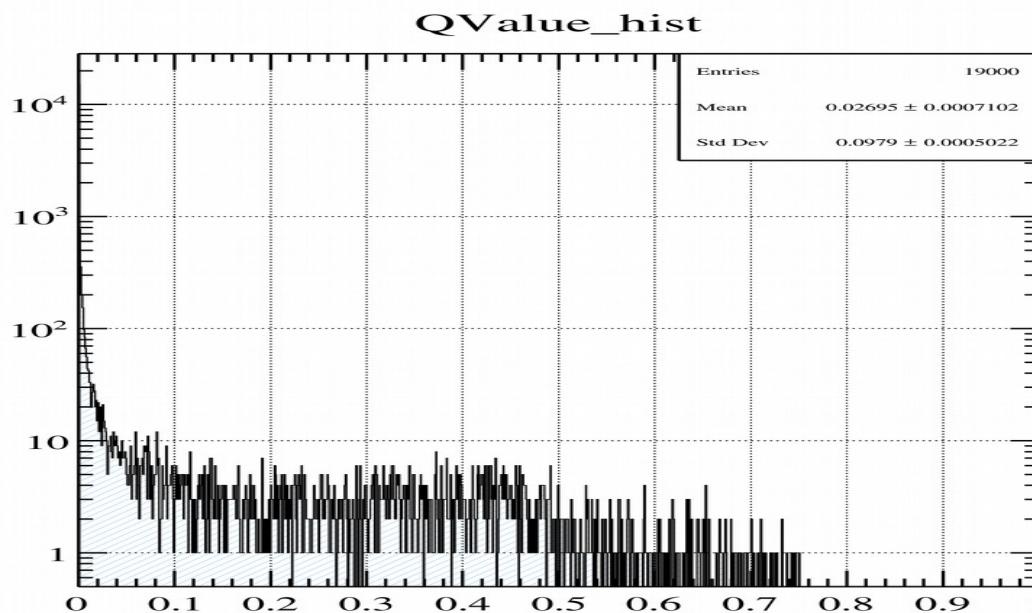
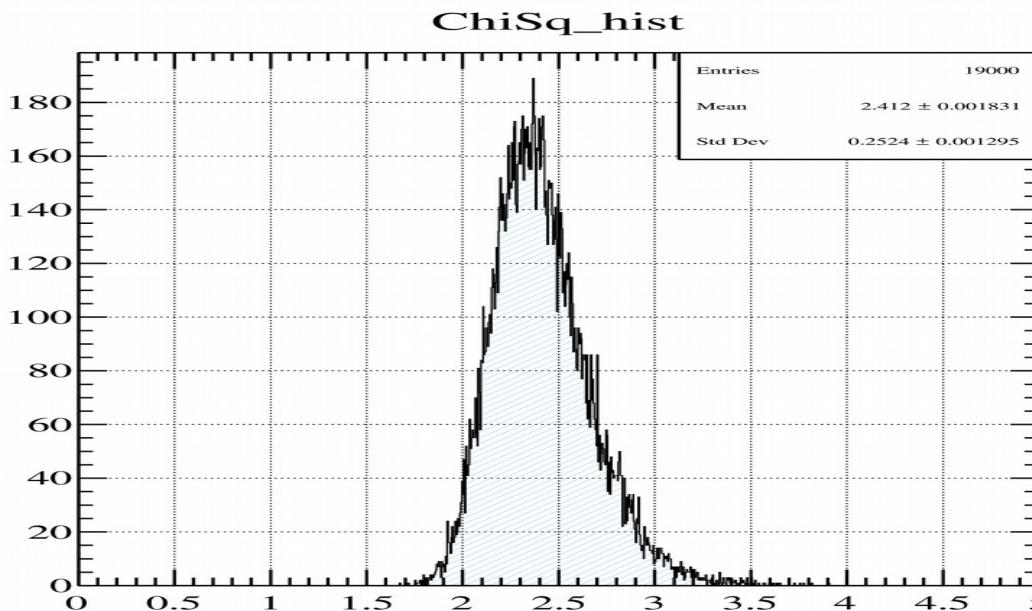
Chi^2 and Qvalue Distributions for Chebyshev Test (NN=3k)



Qvalue Study Fitting: Chebyshev Test (w/ 3k NN)



Chi² and Qvalue Distributions for PhiEta Fitting (NN=3k)



Qvalue Study Fitting: PhiEta (w/ 3k NN)

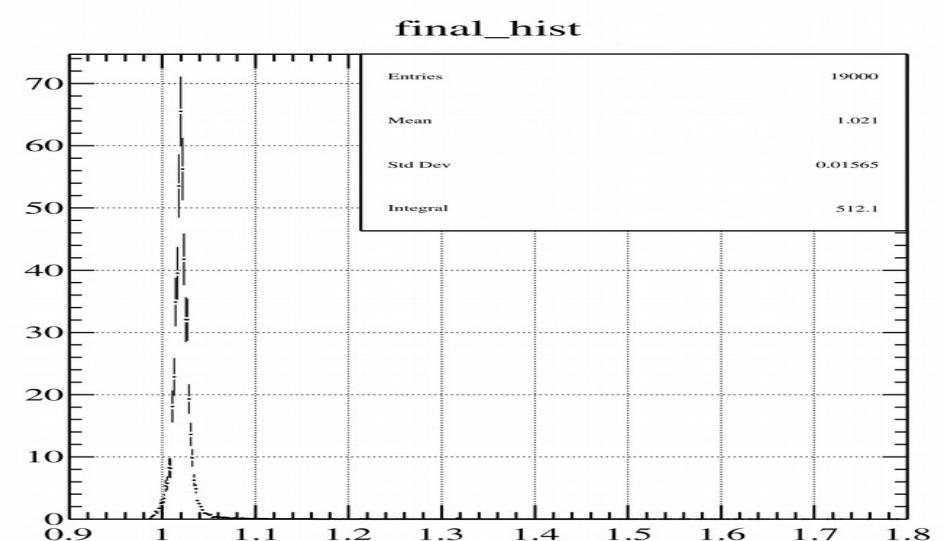
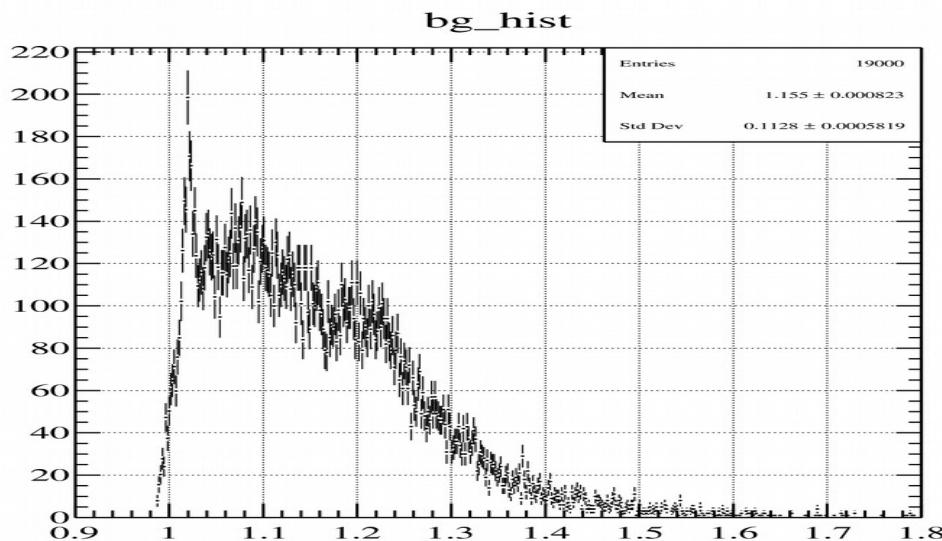
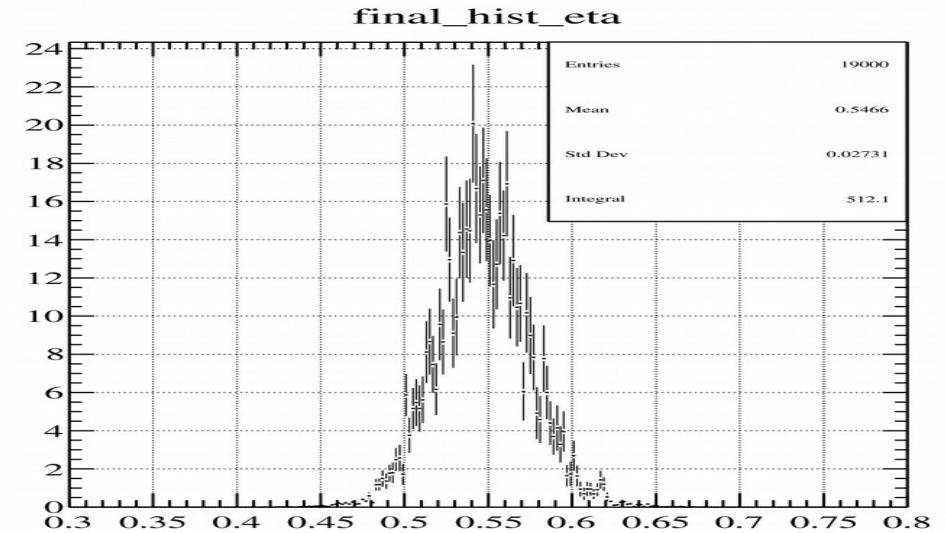
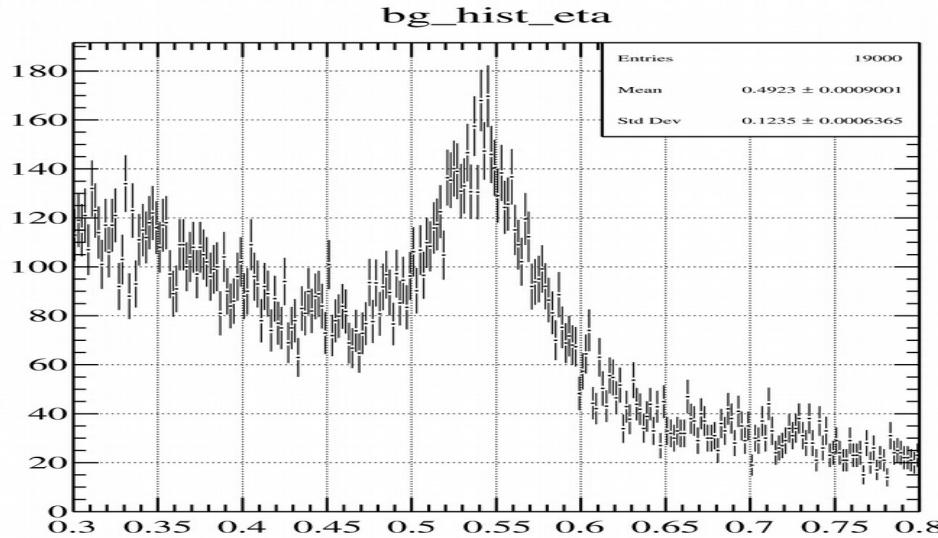


Table of Results

| Nearest Neighbors | Events (Old Results) | Events (New Results) | Fit |
|----------------------|----------------------|----------------------|-------------|
| 1k | 1256 | 1723 | Phi |
| 2k | 1291 | 1700 | Phi |
| 3k | 1293 | 1778 | Phi |
| 4k | 1259 | x | Phi |
| 5k | x | 1781 | Phi |
| 1k | x | 3587 | Eta |
| 2k | x | 3585 | Eta |
| 3k | x | 3699 | Eta |
| 4k | x | 3616 | Eta |
| 3k | 318 | 512 | Phi and Eta |