Keith E. Turpin – 08.16.2004 – Current results form J/psi mass corrections.

The following plots were produced using all the data from (0 < z < 35) & (0 < costheta < 1) and include the following alpha-beta space: (0.9934 < alpha < 1.0024) & (0.005 < beta < 0.080)

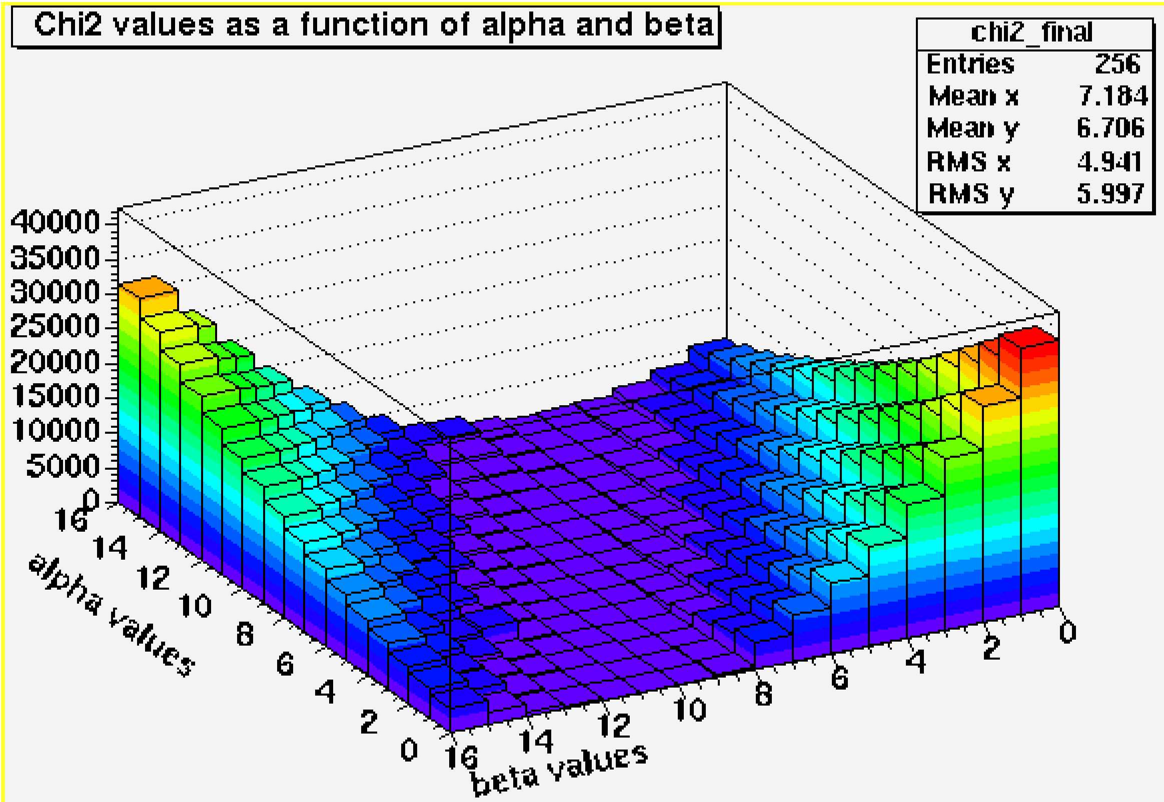


Fig. 1: This LEGO plot of chisquared values obtained from J/psi M vs. pt fits maps out alpha-beta space.

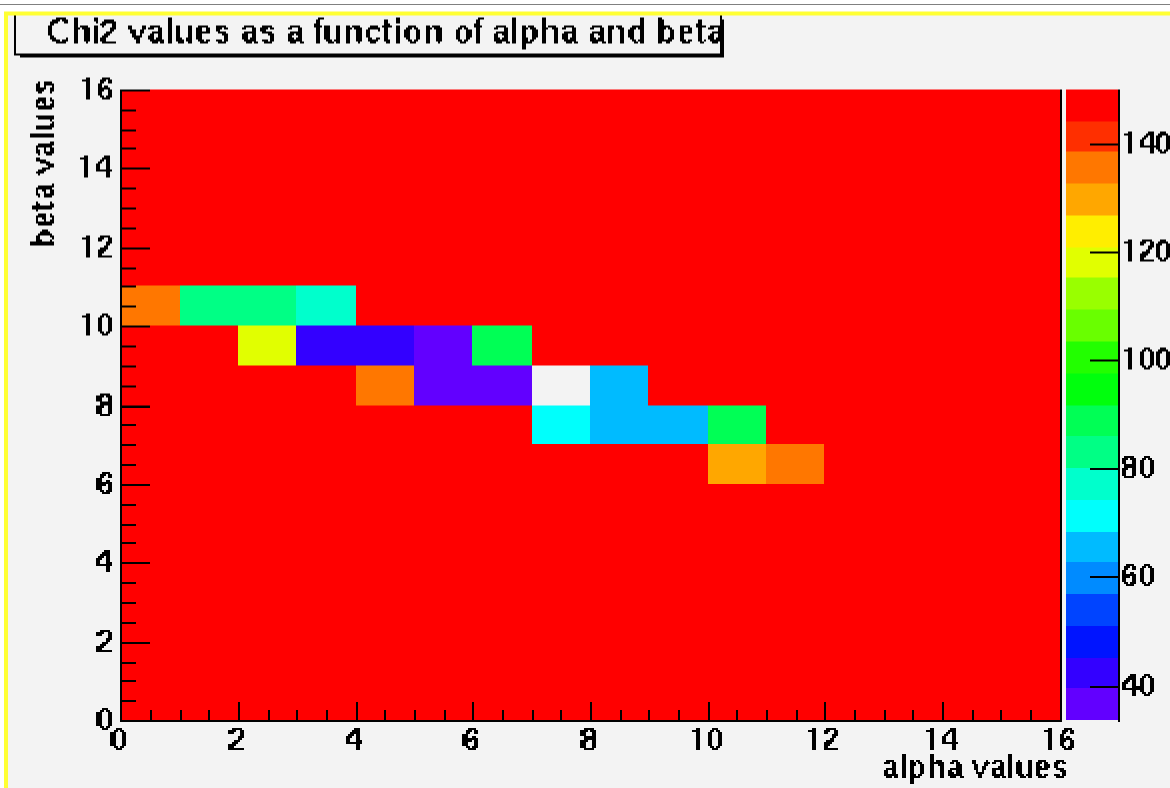
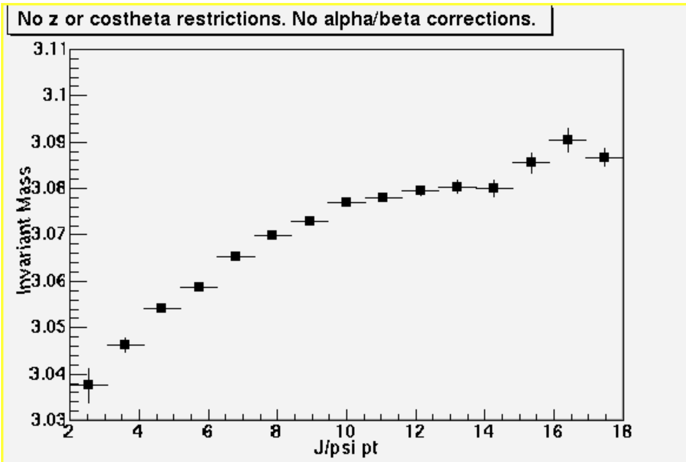
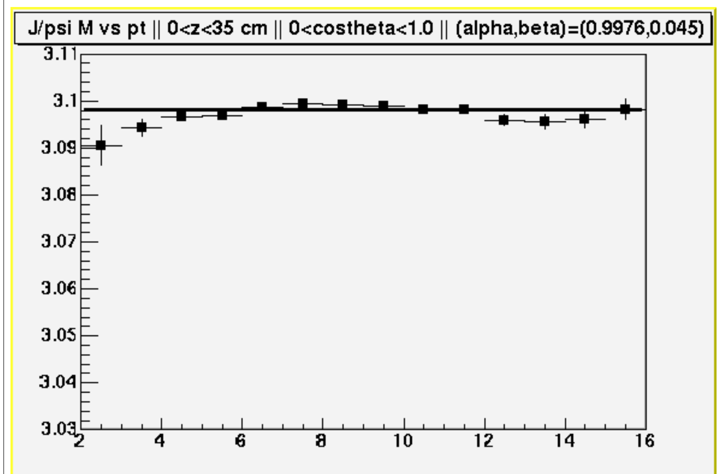


Fig. 2: In this overhead view the maximum chisquared value has been set to 150 to show that the chosen range of alpha and beta results in the best posible chisquared value. The best chisquared ~ 33 is colored white.

How well do the correction parameters work?

Fig. 3: Before	*Fig. 4: After*
	

Looks good, but what about a close up?

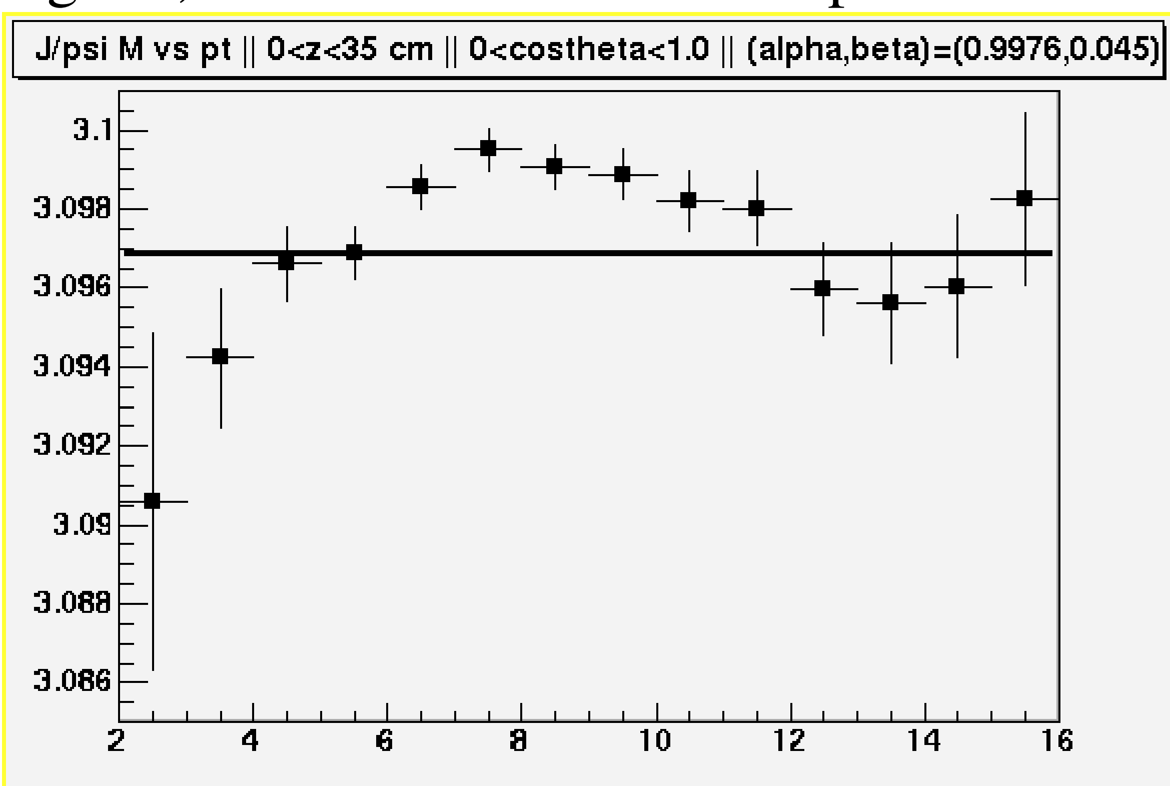


Fig. 5: The fit has a chisquared ~ 33 with 13 degrees of freedome. Note that only 43% of the error bars touch the fit line.

For the next step I split costheta space into 7 regions: (0, 0.2), (0.2, 0.4) , (0.4, 0.6), (0.6, 0.8), (0.8, 0.9), (0.9, 0.95), (0.95, 1.00). I found the 'best" correction parameters and then used them to create a M vs pt plot.

To make sure the framework of this process works correctly, I use my new code to make a J/psi vs pt of which I am already familiar with. In this case, I set all of the 7 regions (alpha,beta)=(1,0) and compare it to the origional plot produced by Muon.C

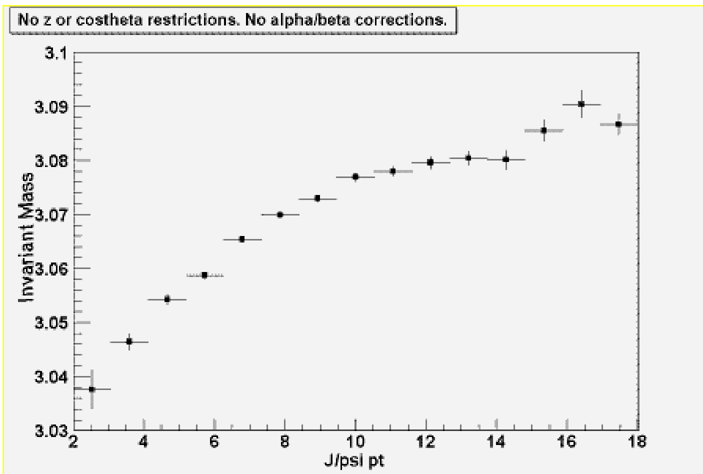


Fig. 6: The origional plot.

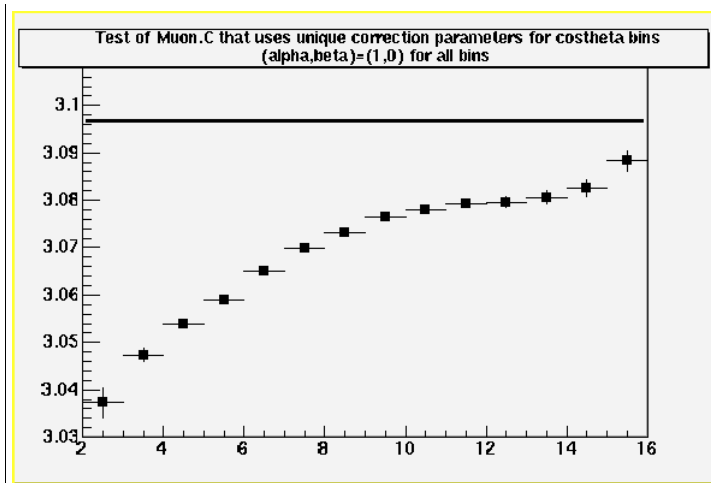


Fig. 7: The new plot.

Next I acutally find the parameters for each bin and produce the M vs. pt plot of them.

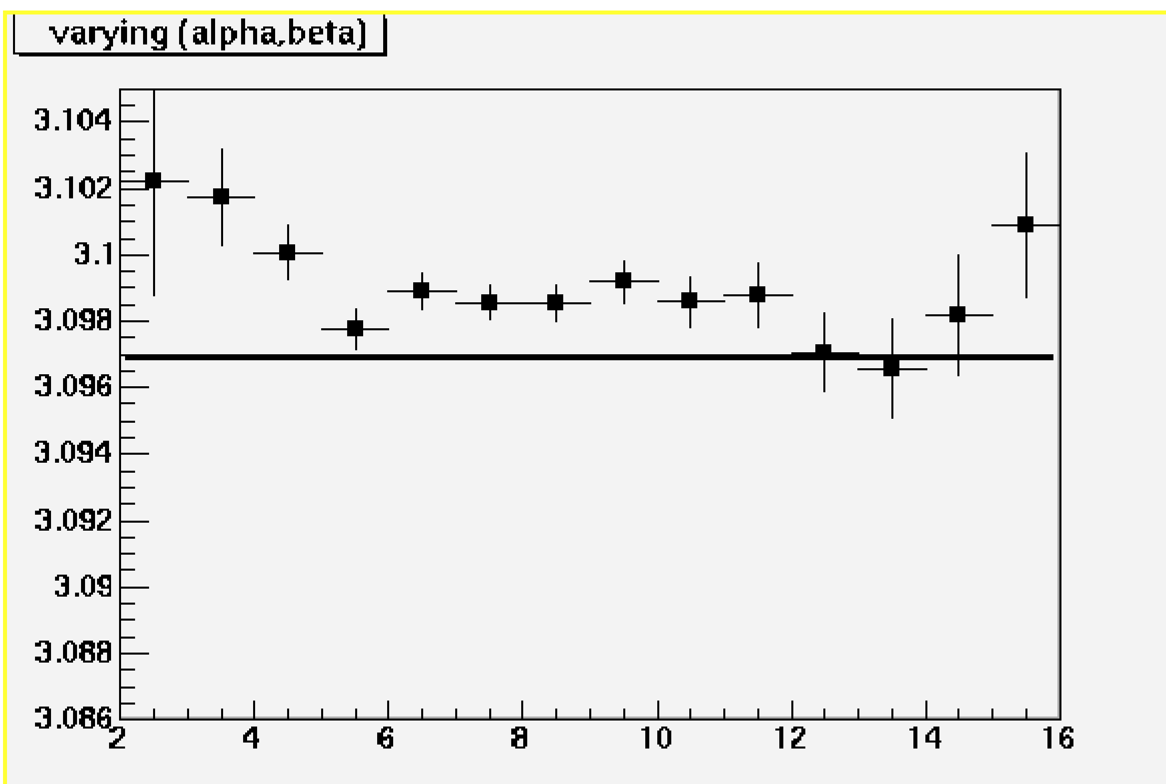
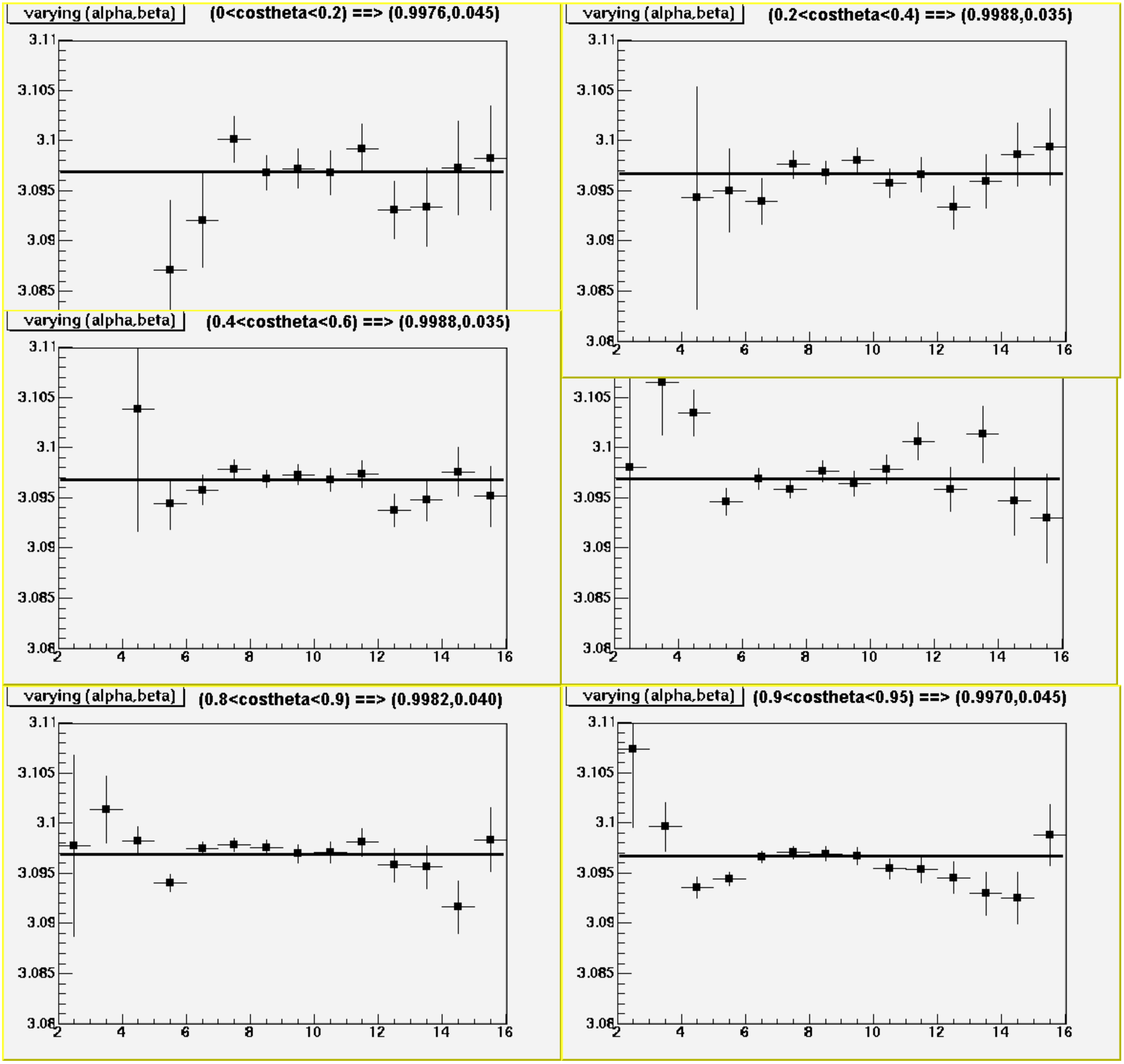


Fig. 8: Unfortunately, the fit correction ended up being worse than the first, "one bin" correction. Note,though, that the line is straighter, it is just above the set value for J/psi mass.

Now take a look at the 'best fits" from each costheata bin to make sure that everything looks okay there.



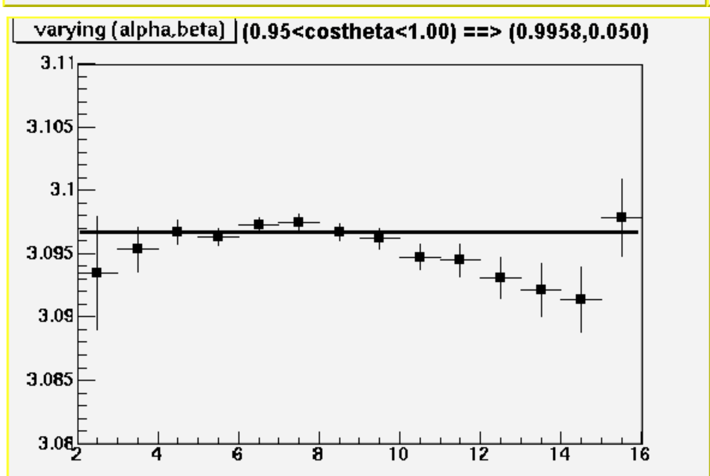


Fig. 9: Note that there is still a curve to the last two bins. In adition, they have larger chisquareds and beta values than the other terms. So, is it posible to split the last two bins up further?

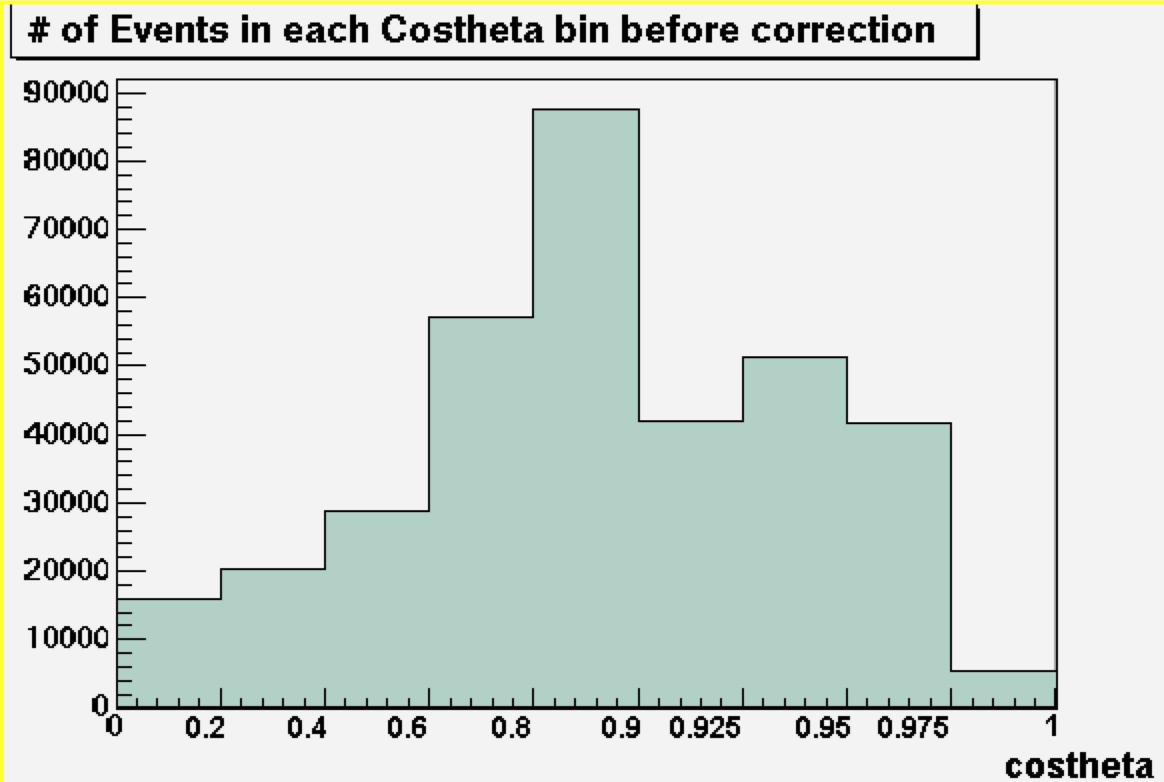


Fig. 10: There are enough statistics to break up the two bins into three.

After successfully finding the best correction parameters for the new smaller bins, I found an interesting pattern in the old and new alpha values. As can be seen in Fig. 11, the “old” alpha is the average of the “new” alphas that overlap that bin.

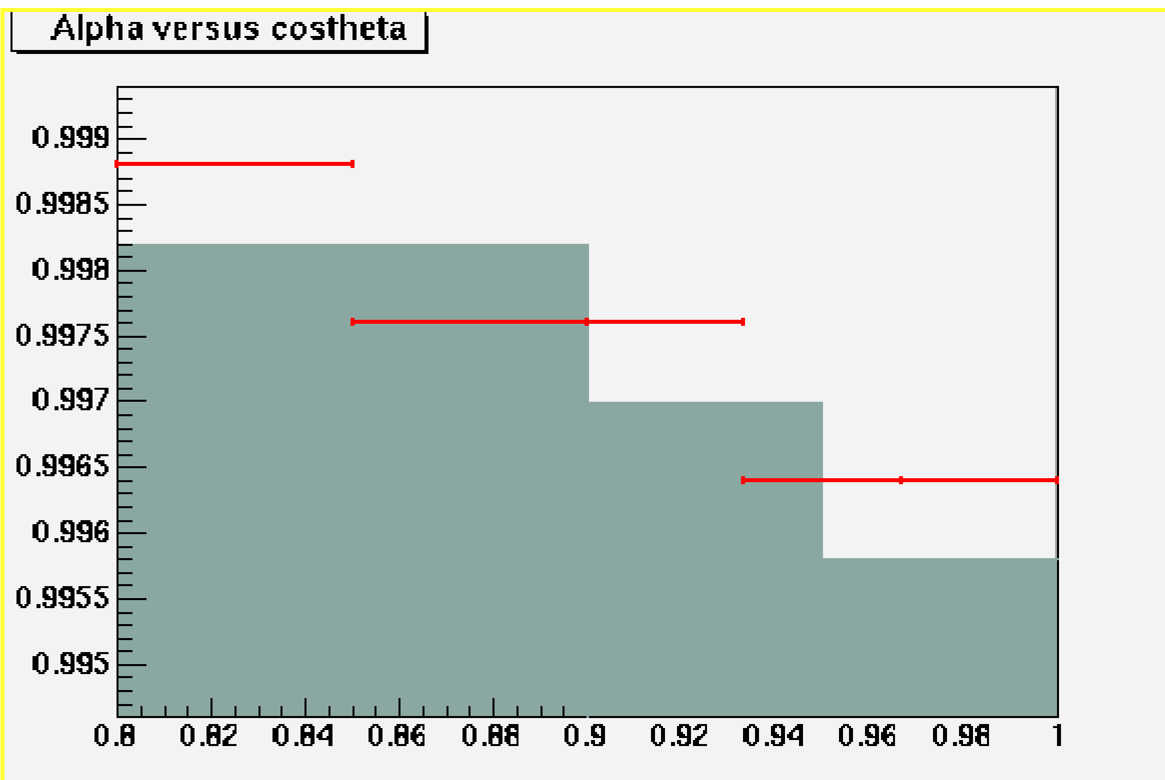


Fig. 11: The green bins are the three old bins, while the five red lines are the new bins.