Weekly Updates On nu e Meeting

Research Errors of Fitting 3Gaussian Flux (POT Normalization)

Wenting Tan

Hampton University

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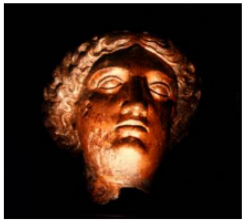
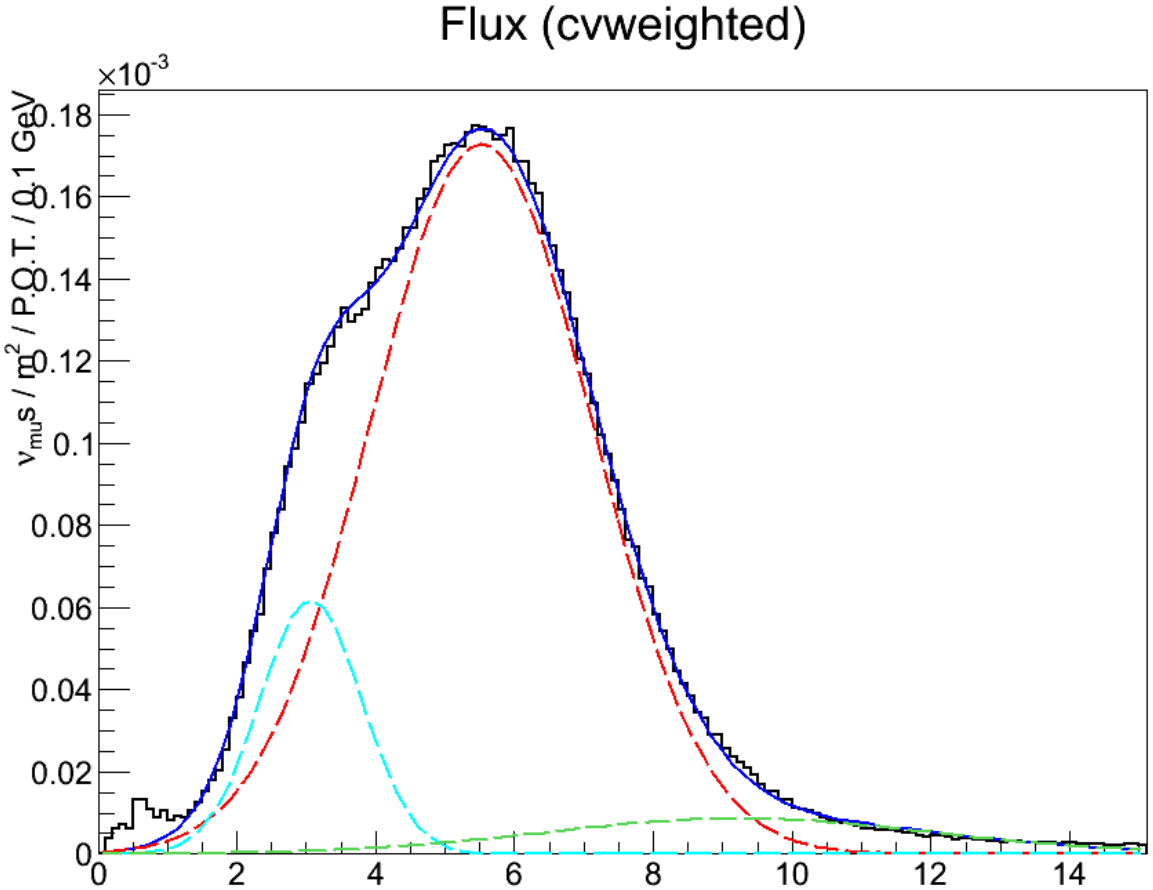


Parameterize New Flux Histogram

3 Gaussian, 9 parameters

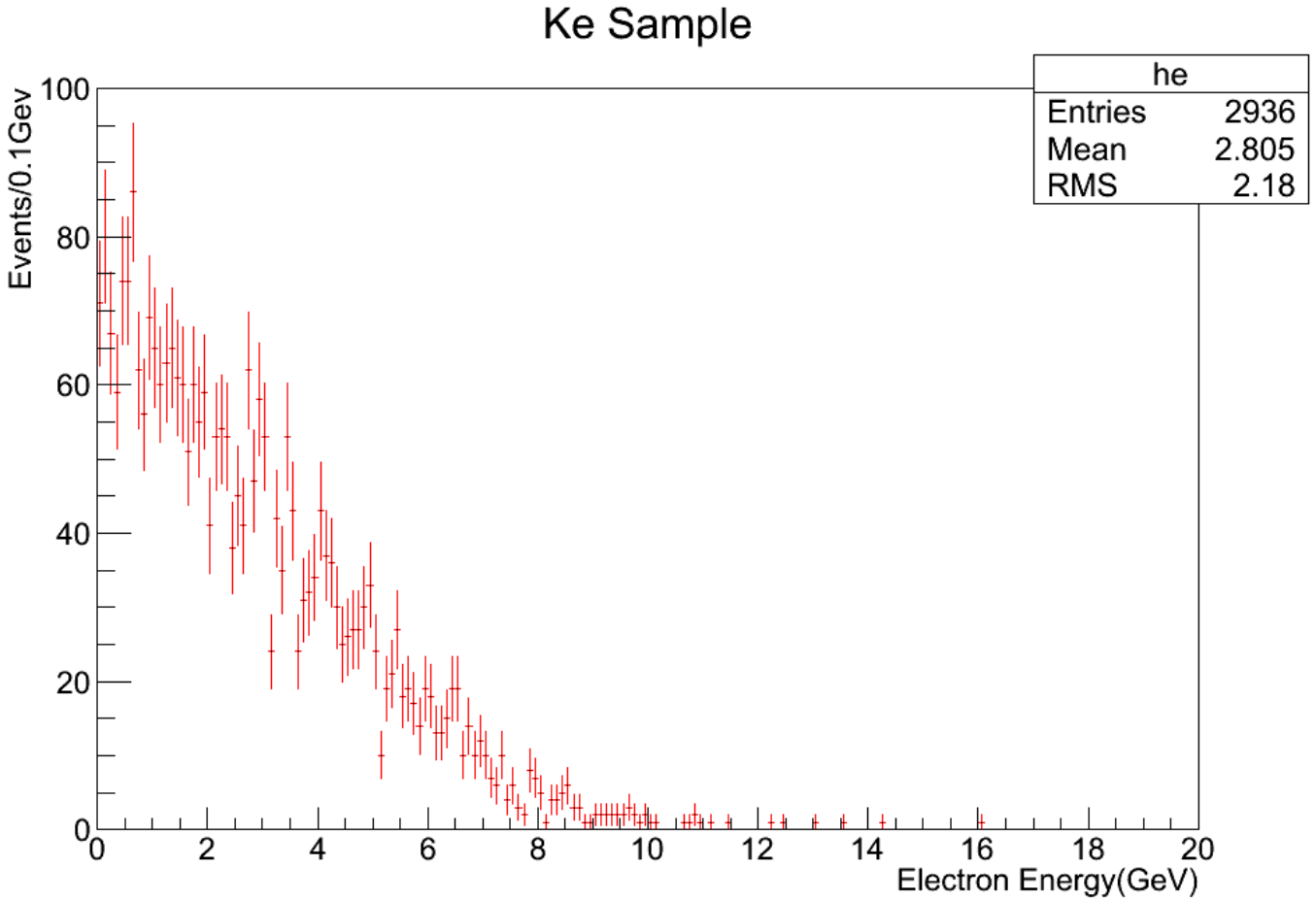


par	value
a1	1.728e-04
m1	5.518
s1	1.601
a2	6.177e-05
m2	3.061
s2	0.738
a3	8.656e-06
m3	9.232
s3	2.814

Electron Spectrum Sample

for 20e20 POT Normalization

Input the functional flux to the model, get a electron kinetic energy histogram. Randomly sample Ke with a Gaussian error.

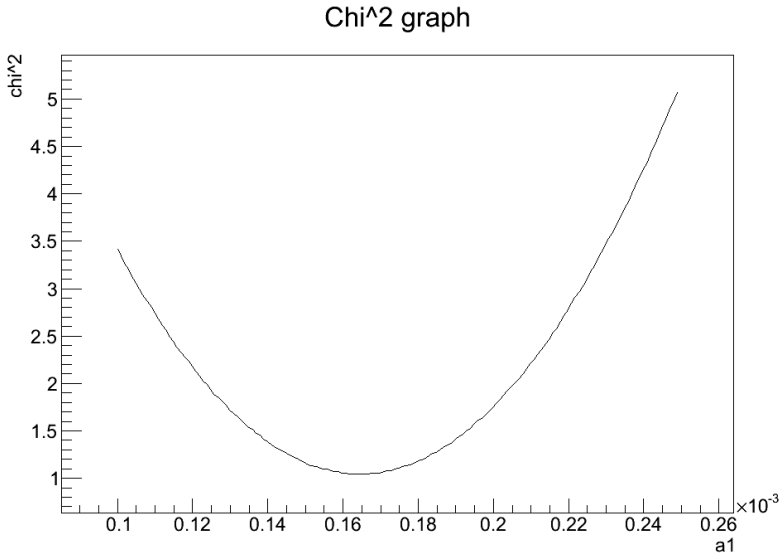


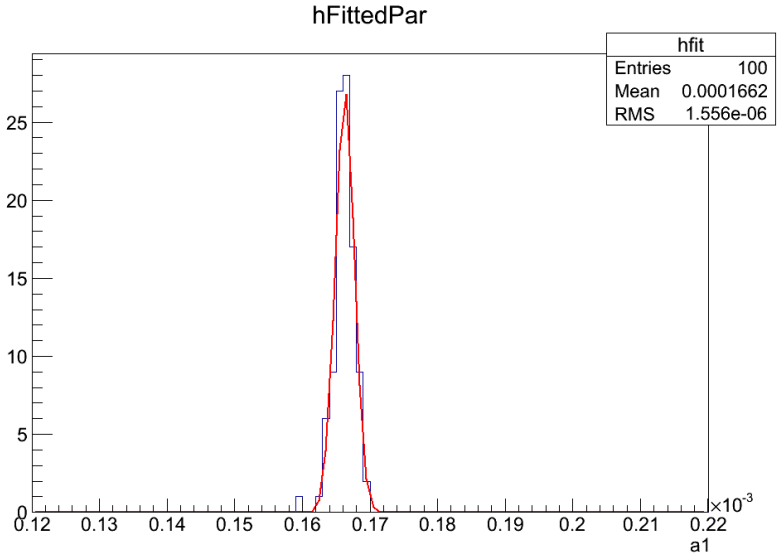
in order to get a reasonable chi^2, we will do the fitting within the range 0-12 GeV.

Fitting 9 Parameters of the Flux

- Within Electron Spectrum Range 0-12 GeV
- Manually Fitting: Fitted par respect to the minimum chi^2; error is the amount of the par changes when chi^2 gets changed by 1
- TMinuit Fitting on 1 sample
- TMinuit Fitting on 100 samples: Fitted pars distributed as a gaussian distribution– mean value is the fitted par, 1 sigma of the Gaussian is considered as error.

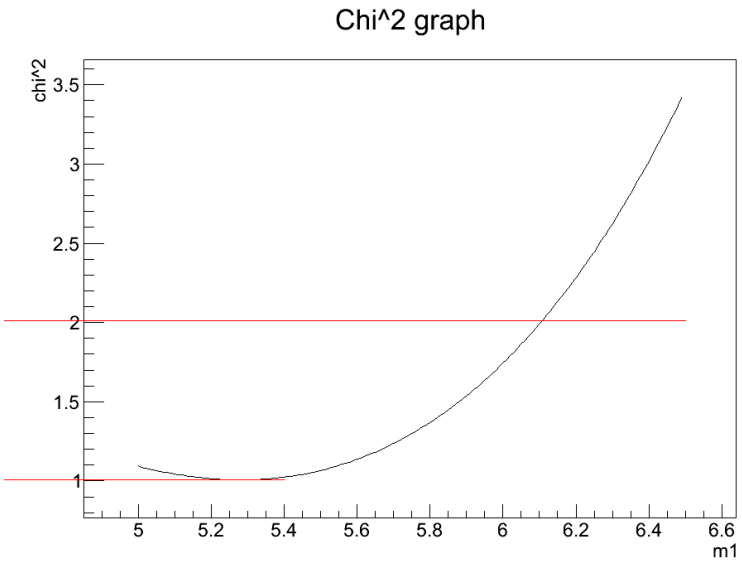
Fitting a1

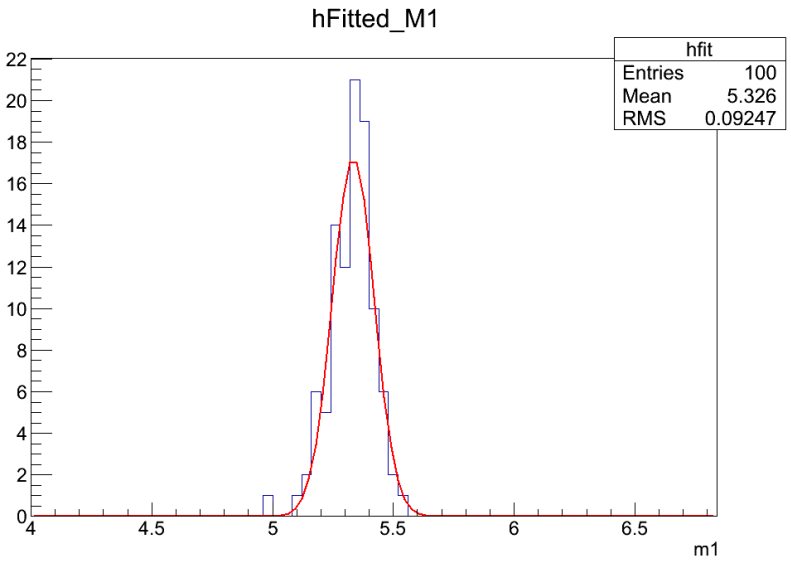




true a1=1.728e-04	Manually by chi^2 graph	TMinuit	100 sets of Fitted Pars
Fitted Par	1.64e-04	1.647e-04	(Mean) 1.663e-04
Fitting Error	0.39e-04	0.370e-04	(1Sigma) 0.014e-04

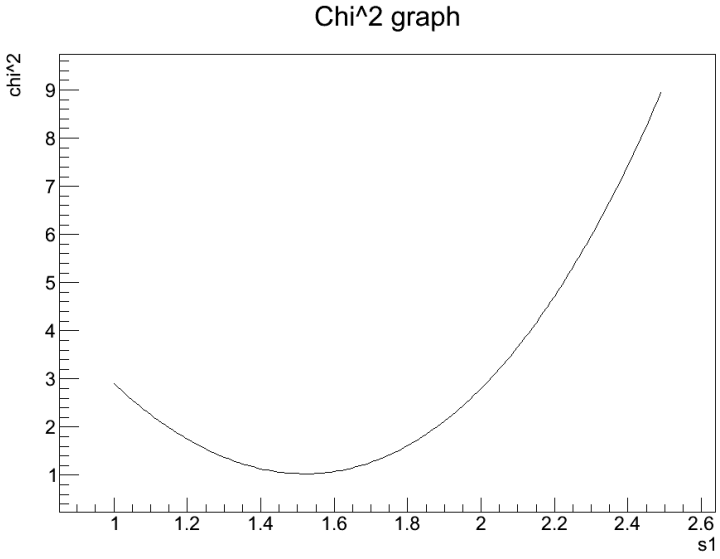
Fitting m1

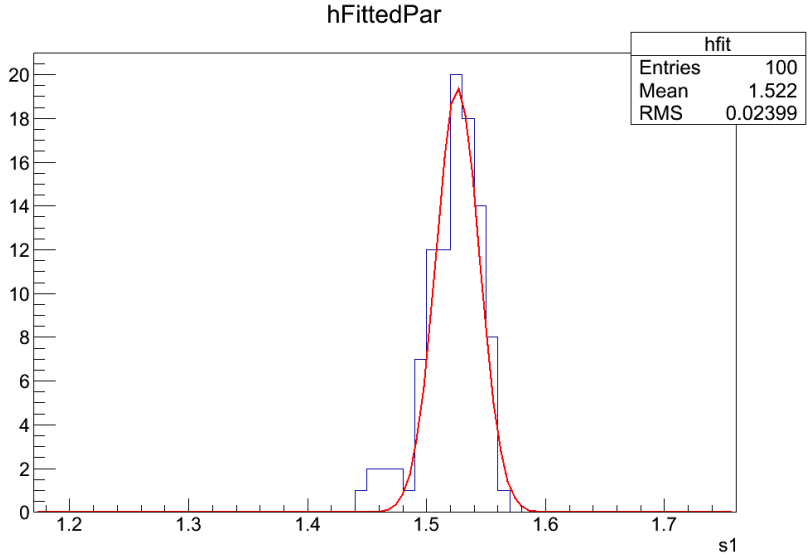




true m1=5.518	Manually by chi^2 graph	TMinuit	100 sets of Fitted Pars
Fitted Par	5.29	5.285	(Mean) 5.334
Fitting Error	0.81	0.899	(1Sigma) 0.086

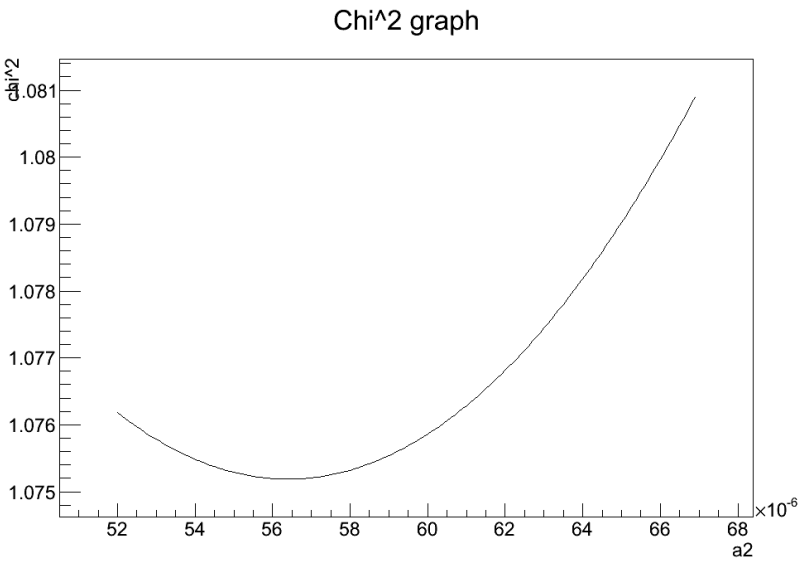
Fitting s1

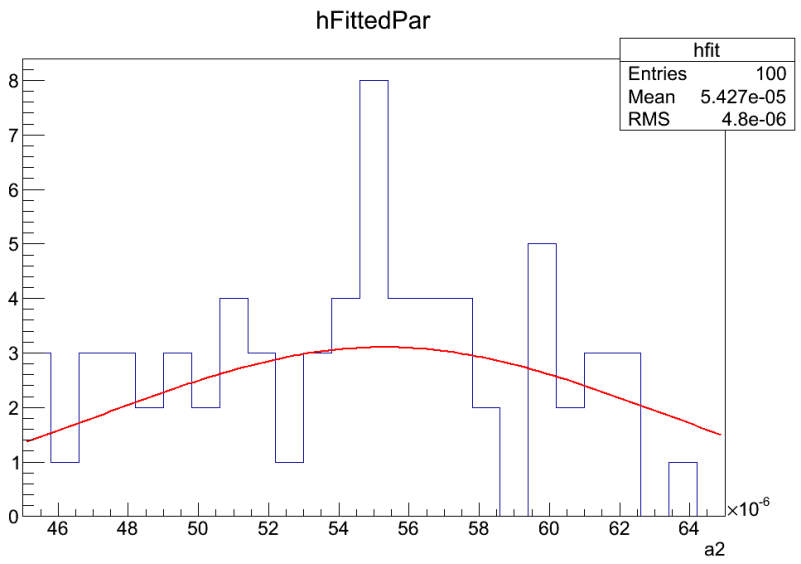




true s1=1.601	Manually by chi^2 graph	TMinuit	100 sets of Fitted Pars
Fitted Par	1.525	1.522	(Mean) 1.526
Fitting Error	0.35	0.343	(1Sigma) 0.018

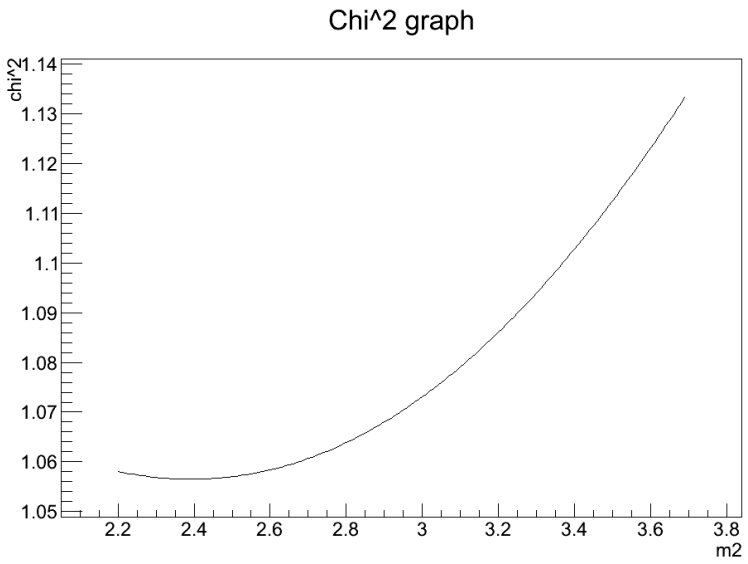
Fitting a2

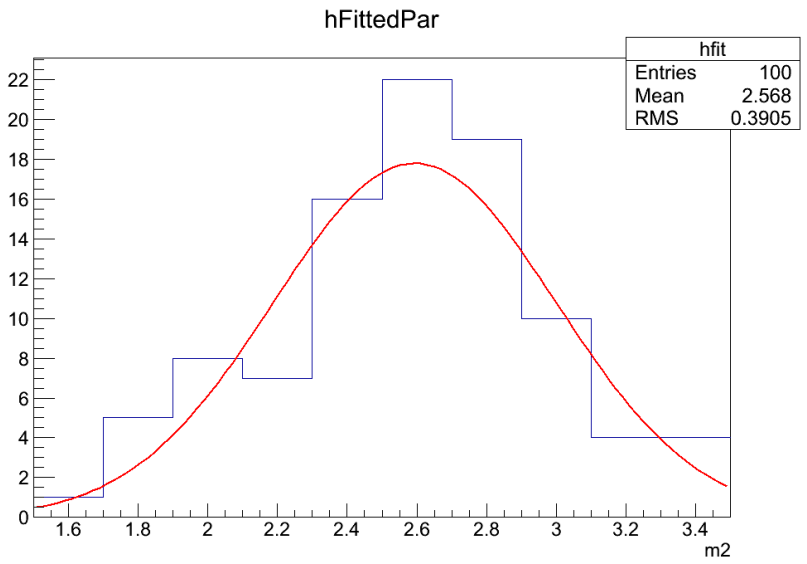




true a2=6.177e-5	Manually by chi^2 graph	TMinuit	100 sets of Fitted Pars
Fitted Par	5.4e-5	5.638e-5	(Mean) 5.528e-5
Fitting Error	~14e-5	13.176e-5	(1Sigma) 0.797e-5

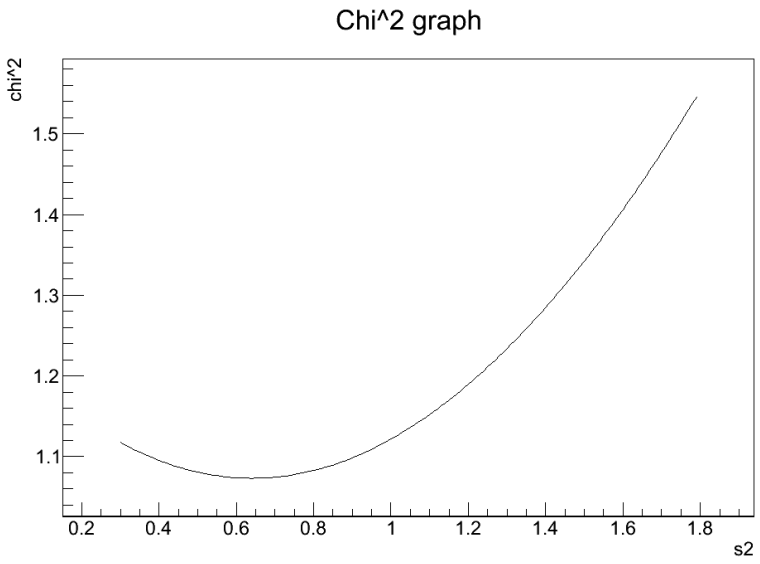
Fitting m2

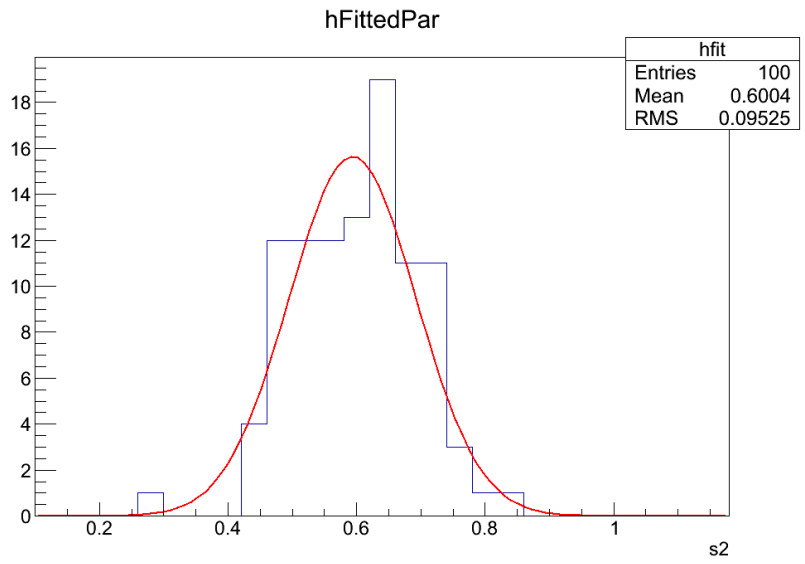




true m2=3.061	Manually by chi^2 graph	TMinuit	100 sets of Fitted Pars
Fitted Par	2.38	2.340	(Mean) 2.594
Fitting Error	~5	5.122	(1Sigma) 0.406

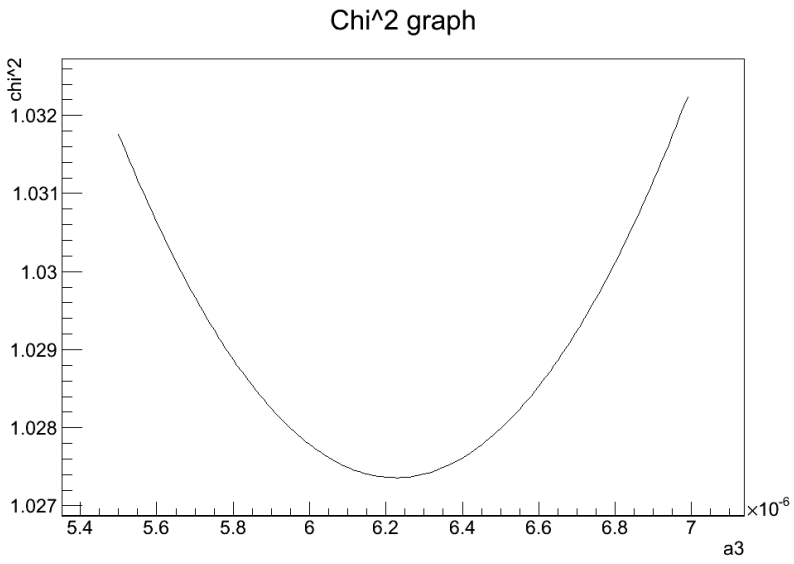
Fitting s2





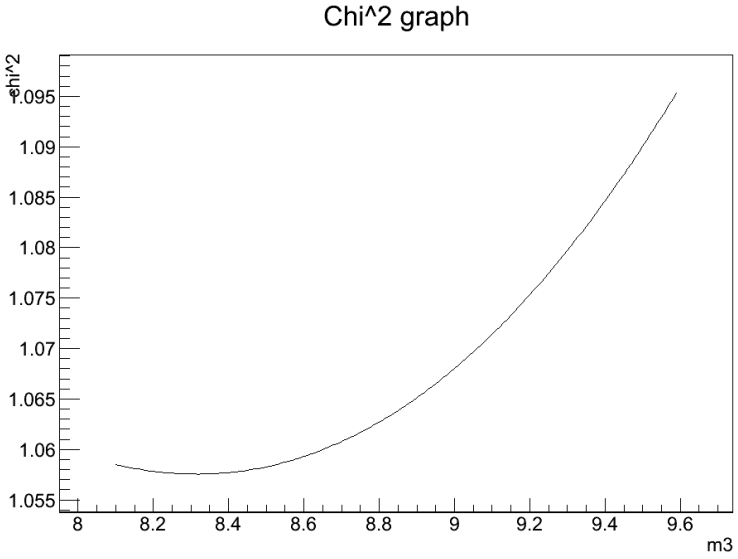
true s2=0.738	Manually by chi^2 graph	TMinuit	100 sets of Fitted Pars
Fitted Par	0.64	0.642	(Mean) 0.594
Fitting Error	~2	1.788	(1Sigma) 0.099

Fitting a3



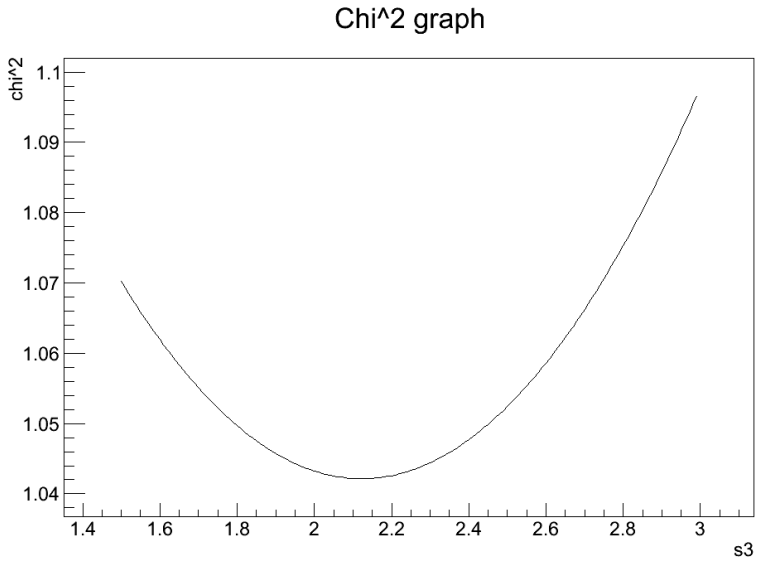
true a3=8.656e-06	Manually by chi^2 graph	TMinuit	100 sets of Fitted Pars
Fitted Par	6.23e-06	6.243e-06	(Mean)
Fitting Error	~big	1.414	(1Sigma)

Fitting m3



true m3=9.232	Manually by chi^2 graph	TMinuit	100 sets of Fitted Pars
Fitted Par	8.32	8.323	(Mean)
Fitting Error	~big	0.179	(1Sigma)

Fitting s3



true s3=2.814	Manually by chi^2 graph	TMinuit	100 sets of Fitted Pars
Fitted Par	2.12	2.123	(Mean)
Fitting Error	~big	1.621	(1Sigma)

Next Steps

- Go on to research fitting errors
- Correlated Parameters & Fitting 9 pars simultaneously
- Electron enegy unfolding matrix