Current status on simultaneous fit on MR tail

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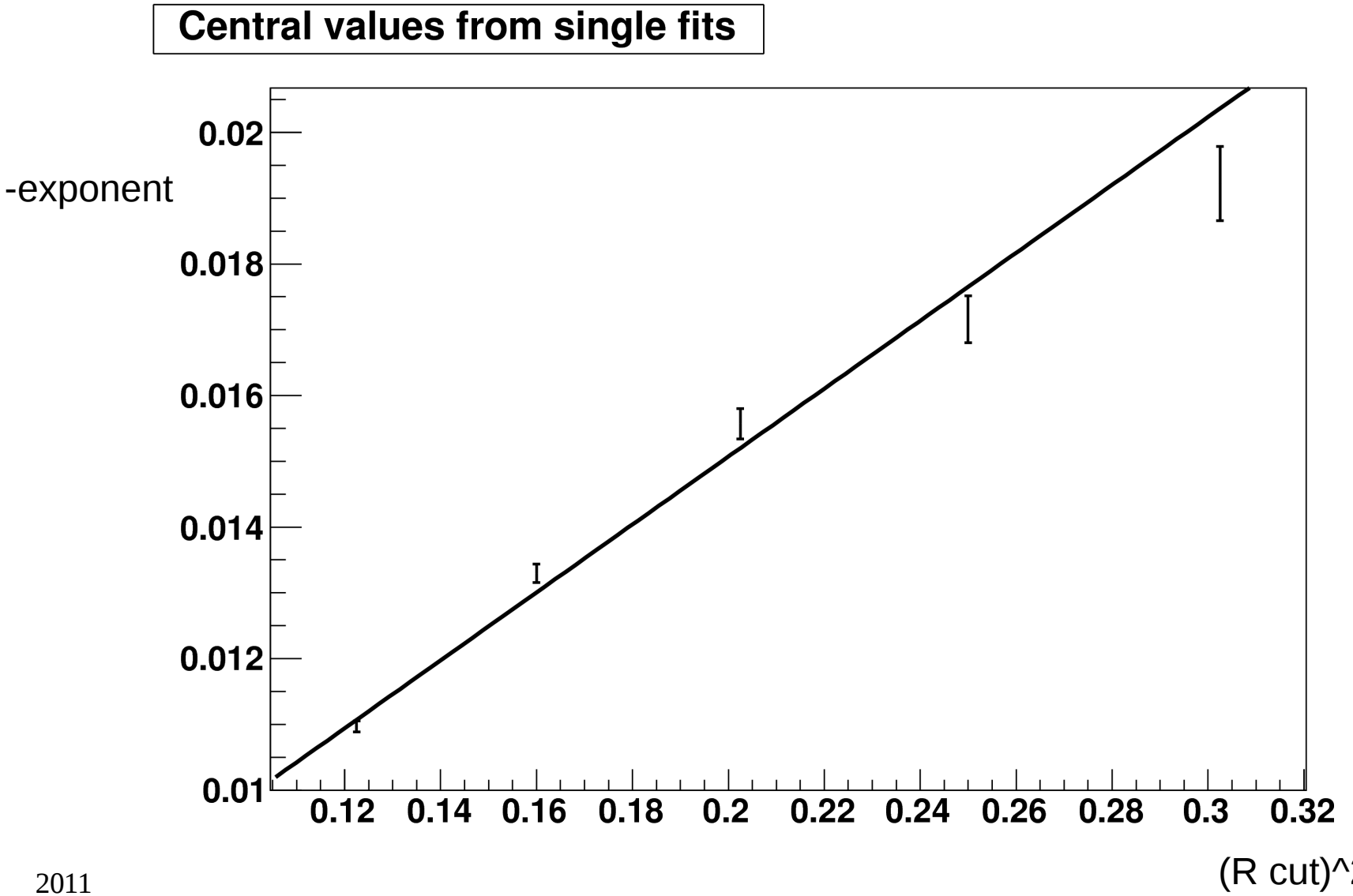
2011 April 27
Razor meeting

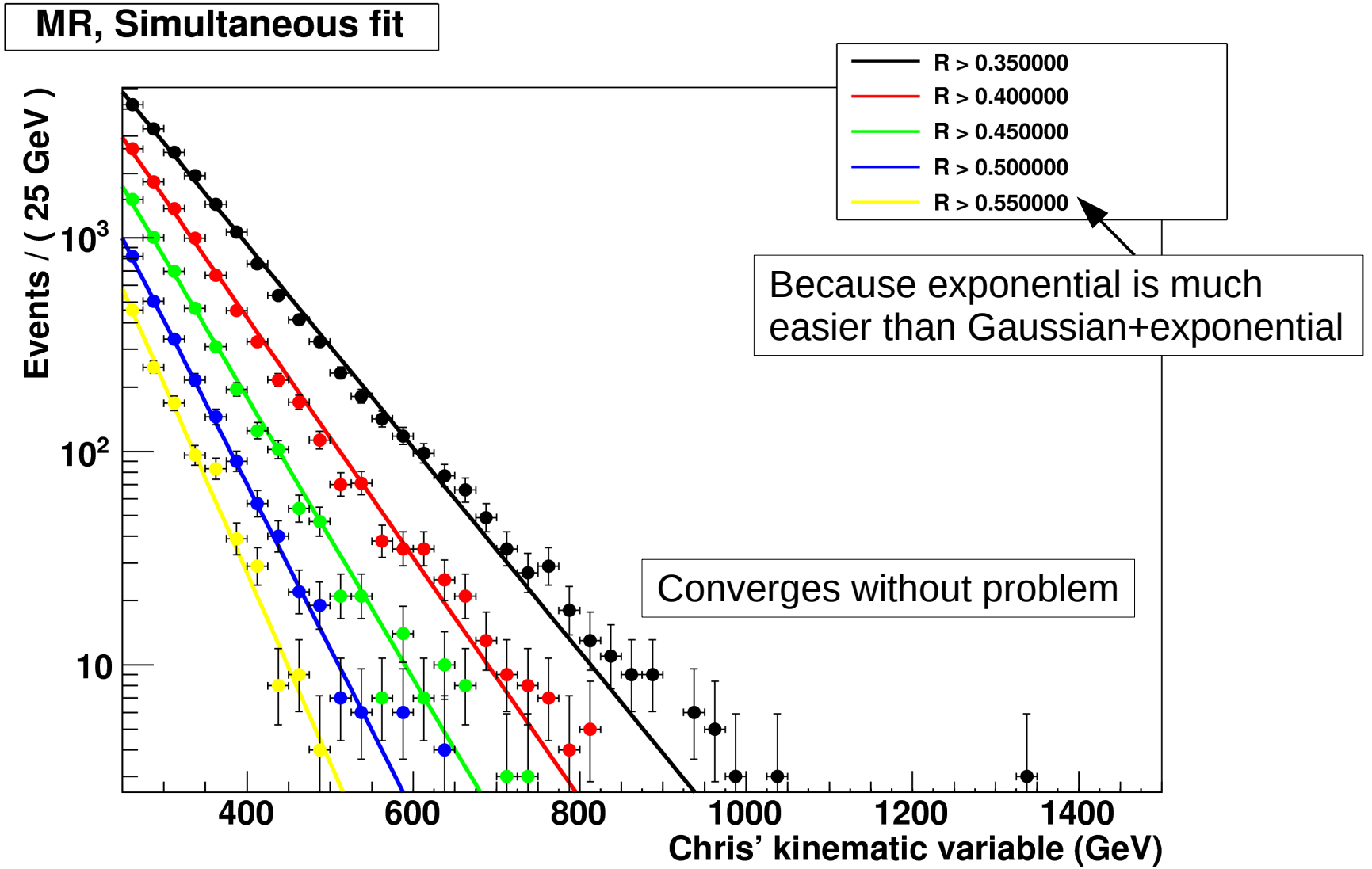
Developing simultaneous fit

- Divide dataset into bins of R
- Model each R>0.XX as an exponential
  - Keep it easy as a first step
  - Could potentially upgrade to Gaussian+Exponential, but the width parameter is giving problems, especially when the Gaussian part is only partly visible
  - Each exclusive R bin is the difference between two exponentials
- The exponent can be written as “a + b (R cut)^2” in the simultaneous fit
- Compare simple fit vs. result from simultaneous fit

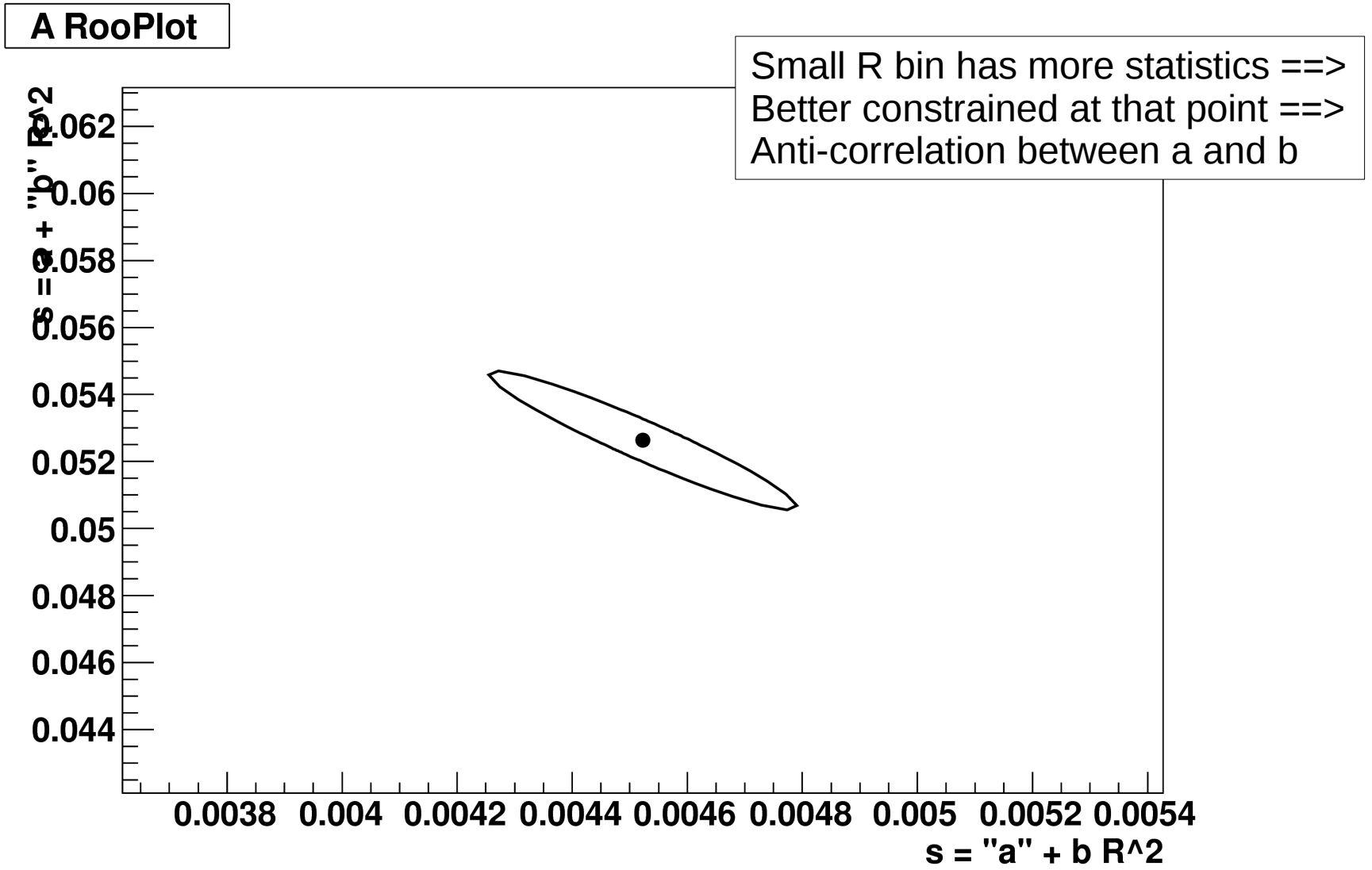
Some MC sample – simple fits



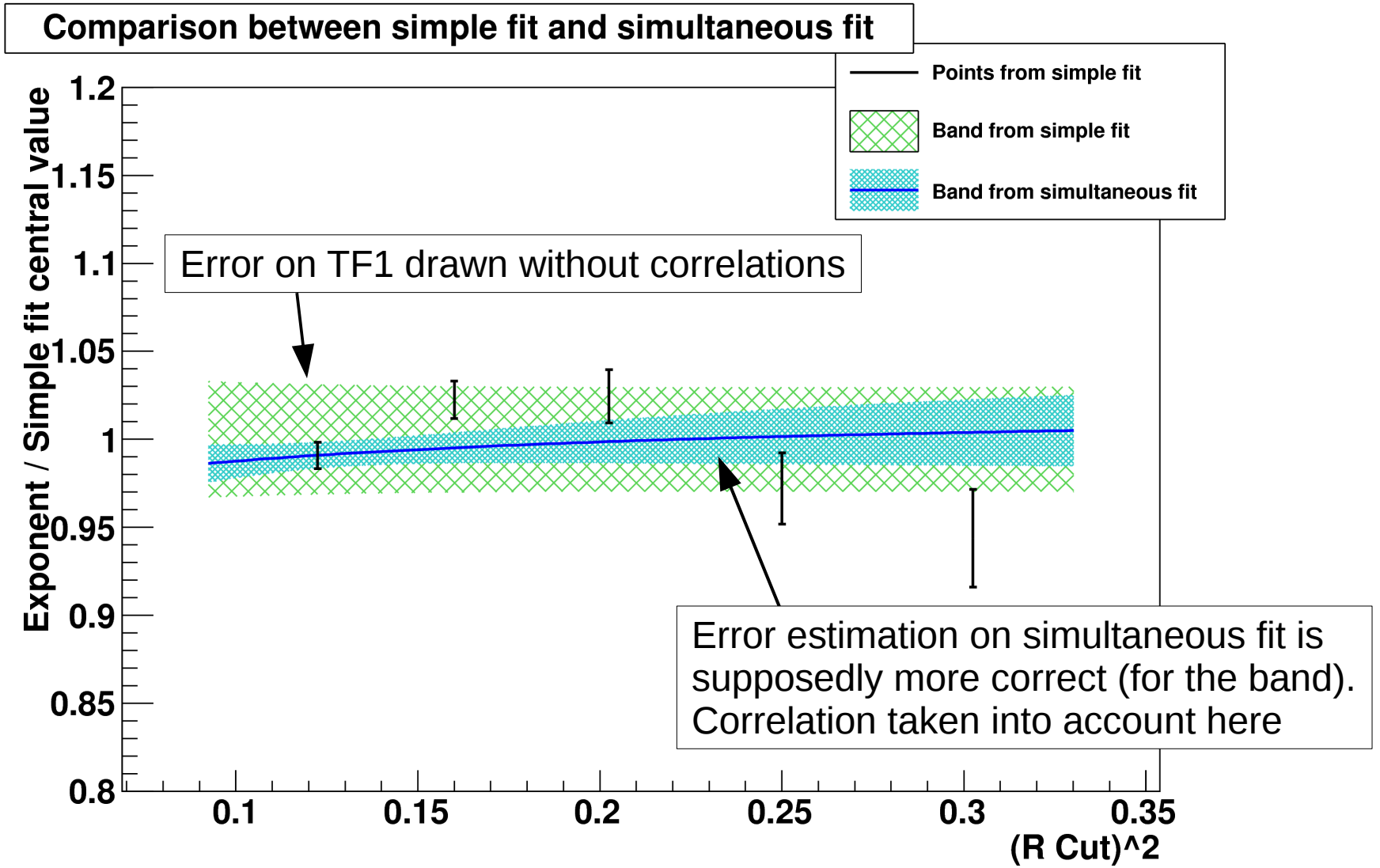
Simultaneous fit



Correlation between a and b



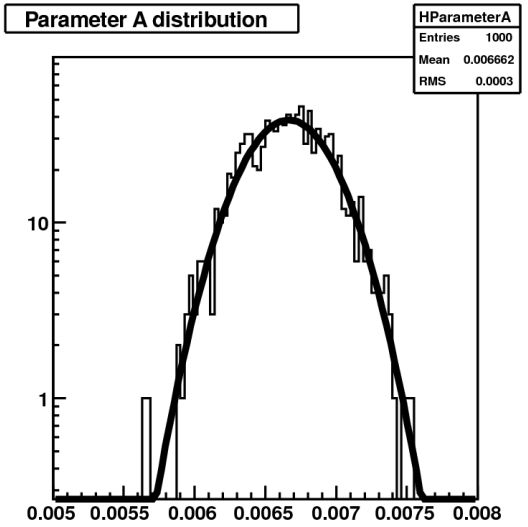
Comparison

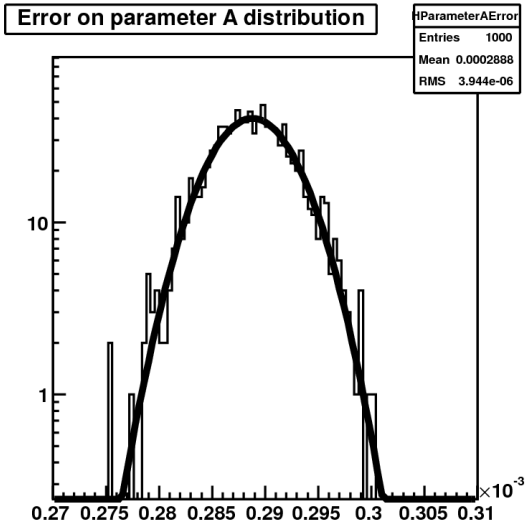

Comparison between simple fit and simultaneous fit
Points from simple fit
Band from simple fit
Band from simultaneous fit
Error on TF1 drawn without correlations
Error estimation on simultaneous fit is supposedly more correct (for the band). Correlation taken into account here
Exponent / Simple fit central value
1.2
1.15
1.1
1.05
1
0.95
0.9
0.85
0.8
0.1
0.15
0.2
0.25
0.3
0.35
(R Cut)^2

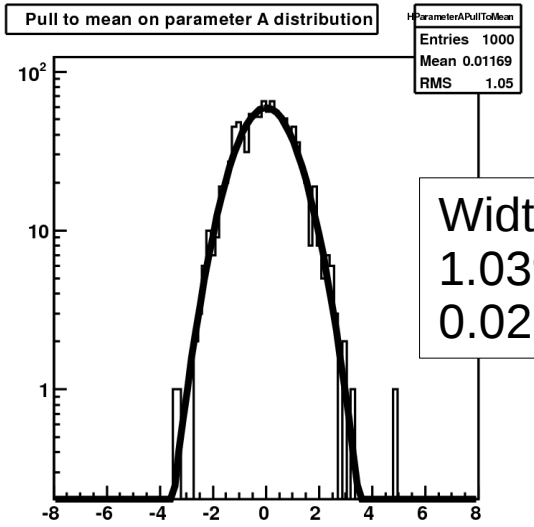
Toys

- Having some trouble generating toy sample
  - Should be a bug somewhere....might need some help if I kept being stuck later this week
  - The generated MR slope is different than what is put in, even with simple exponential fit (???)
- We won't know the bias with this set of toy samples
  - However, the spread and error estimation can be seen
  - Statistics in this set of toys (mimic the "some" MC sample)
    - R binning: 0.35, 0.40, 0.45, 0.50, 0.55
    - Average number of events in each exlusive bin: 8500, 4500, 2300, 1100, 1200
- Once it's fully debugged, run also with other amount of statistics

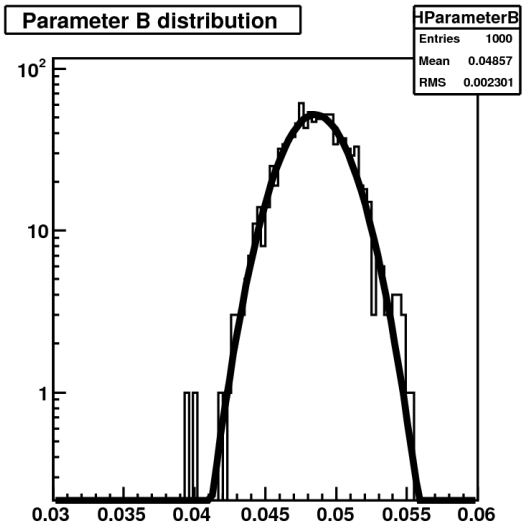
Result of toys

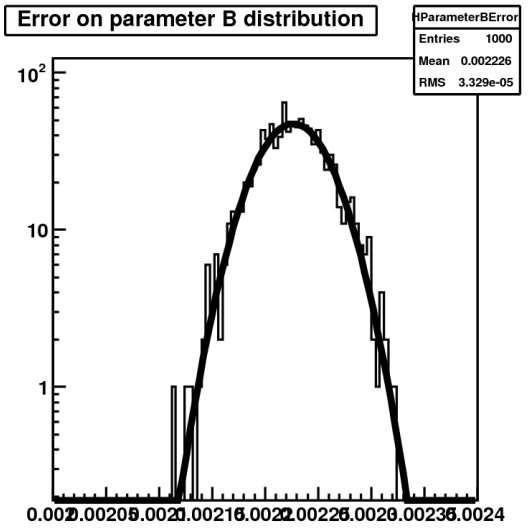


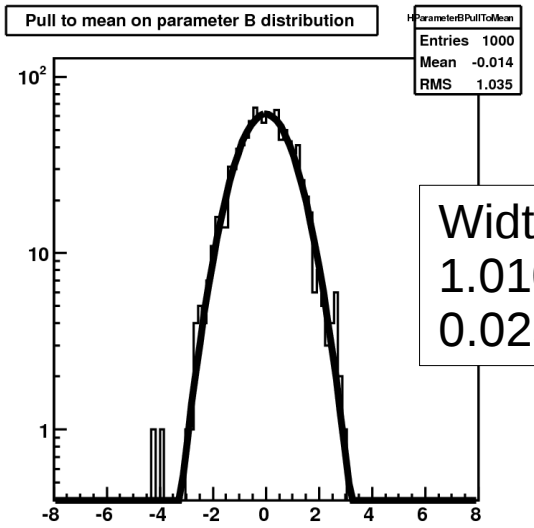




Width: 1.039 ± 0.028







Width: 1.010 ± 0.025

Error on parameters a and b looks OK

Outlook

- Finding a way to properly generate toys....
- Still need to learn how to export workspace
- Move to cases with more than one component soon