

# First Steps Towards Boot-Strapping

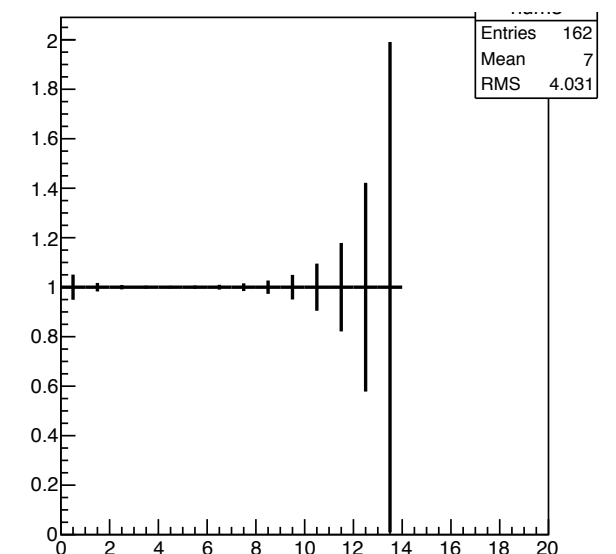
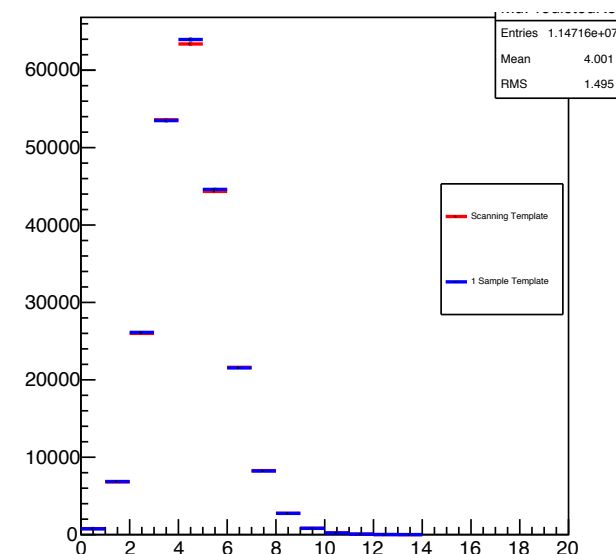
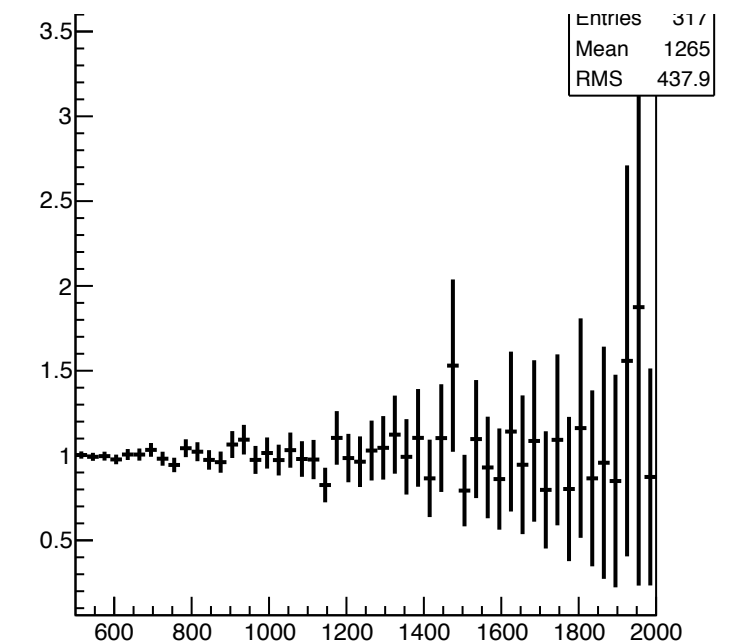
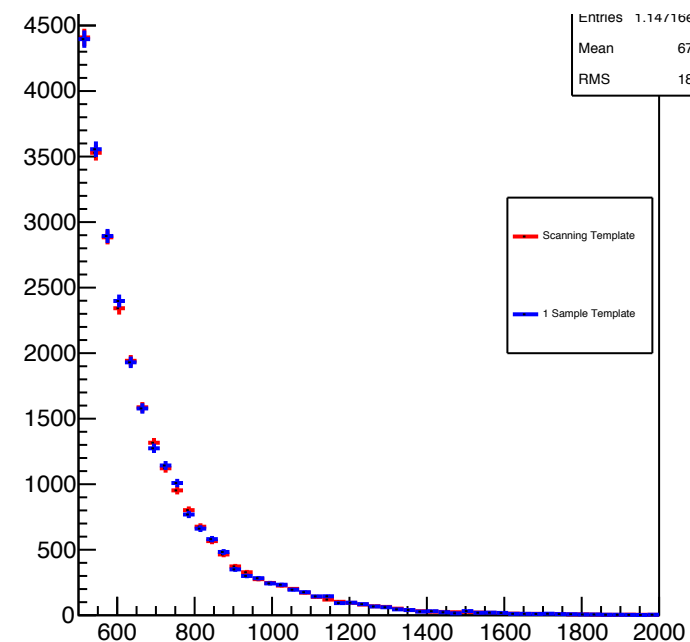
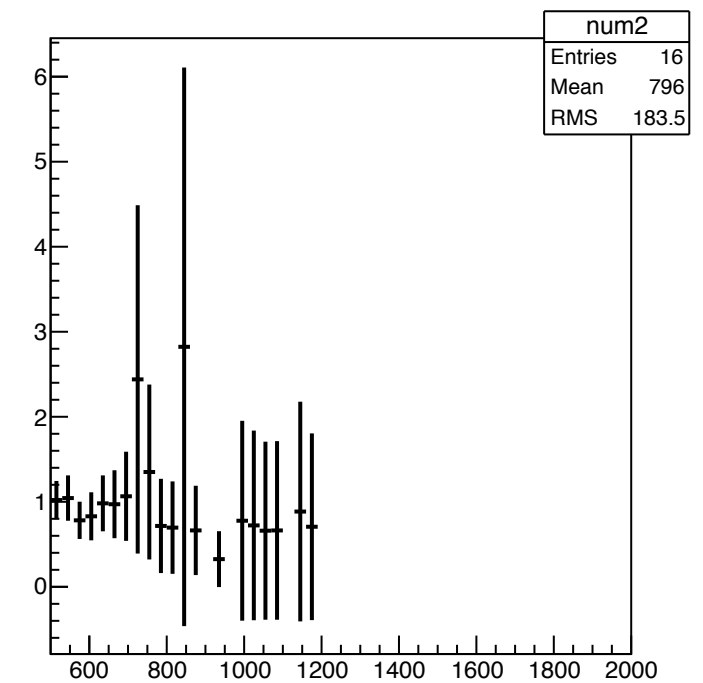
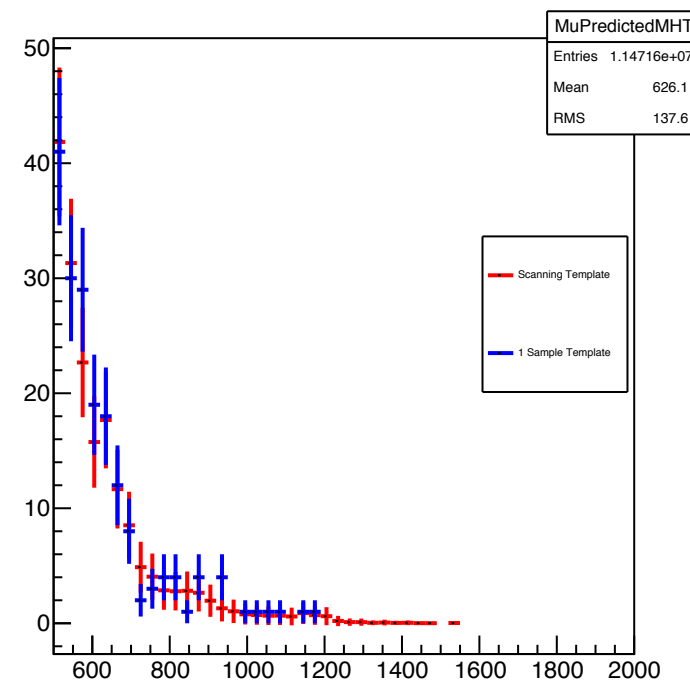
Rishi Patel

# Overview

- Given a Tau Response template and a muon event smear the pT of the muon to emulate the Tau
- Ahmad's approach: Sample once, simple case where you sample once (each muon contributes to one search bin)
- Keith's suggestion, take one muon and smear the pT integrating over the template
  - Get a set of smeared muon pT contribute to multiple bins
- Statistics problem arises because when you sample the tau template multiple times (bootstrapping) you a mixed uncertainty from the muon CS stats and the bootstrapping (weighting the contributions from the different muons)
- Here just show a comparison of the tau bkg pred. sampling once and 'bootstrapping'

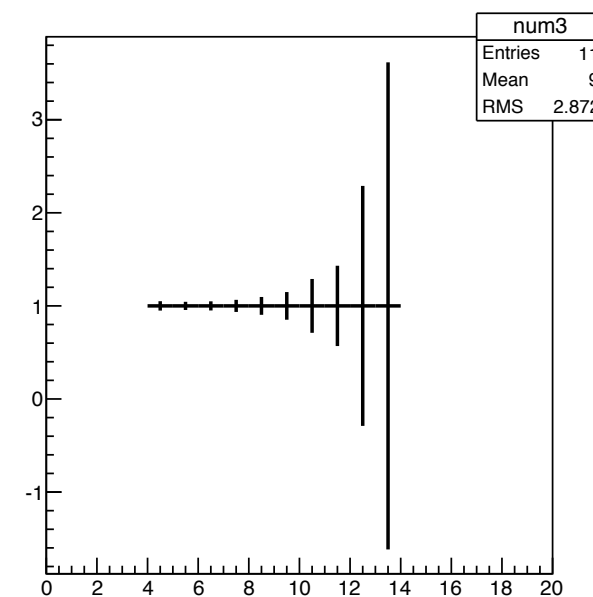
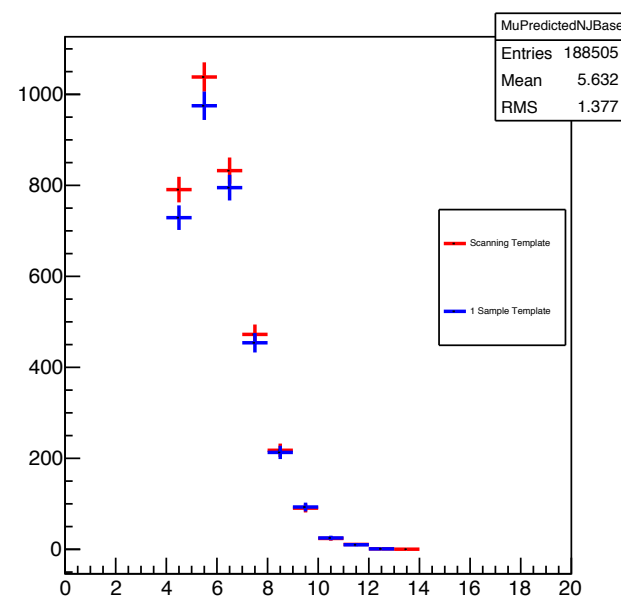
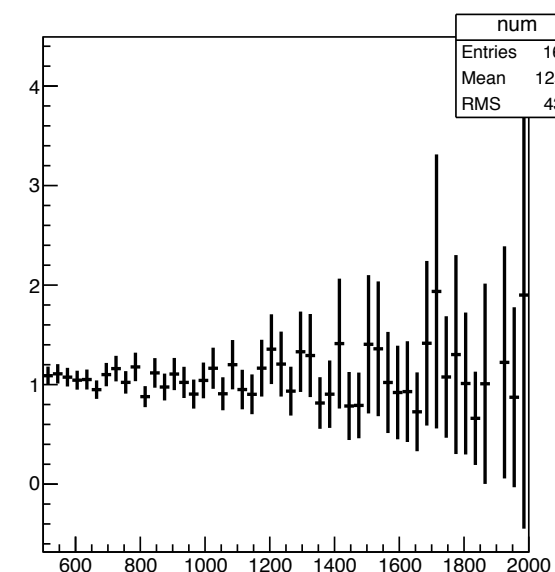
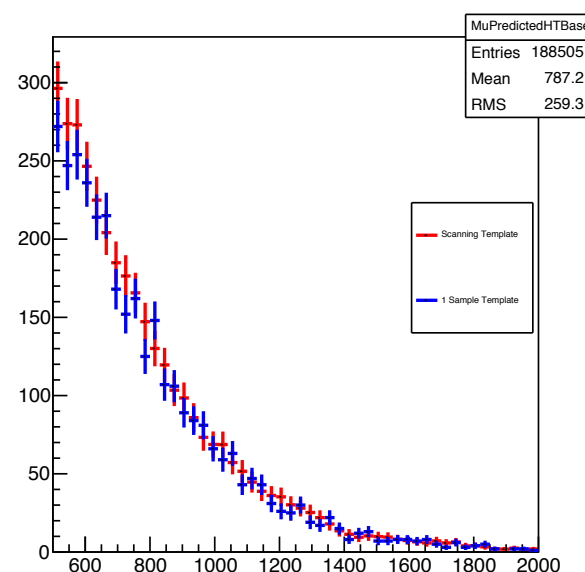
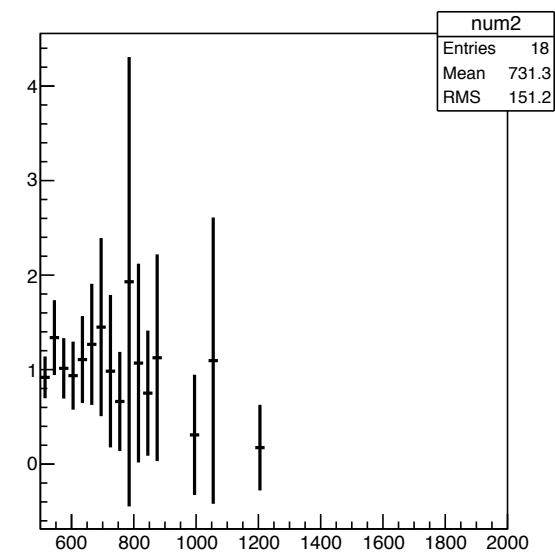
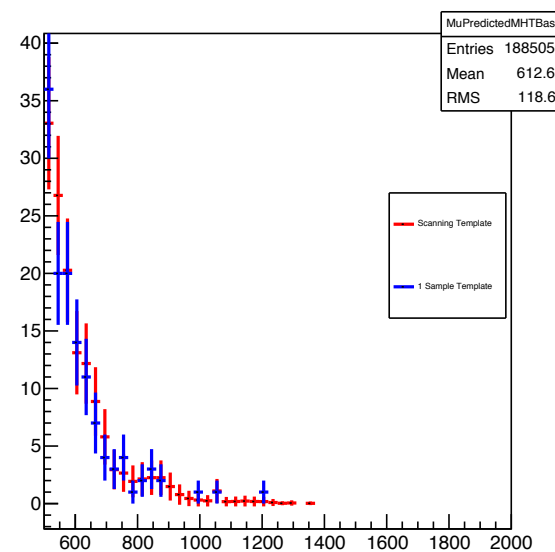
Computed over  
all TTJets events w/o  
baseline suggestion:

KEY: Both perform  
the same because even  
sampling just once you  
have enough muons to  
get a prediction for the  
whole search region



Computed with the  
baseline cuts:  
recomputed with the  
smeared muon pT

KEY: Now you can see  
in the tails of the MHT  
and NJet distribution  
sampling the template  
once is not enough  
(NOTE: This is not the  
full TTJets sample)



# TO DO

- Plot bkg prediction, the contributing Muon control sample events (unweighted),
- Additional plots for studying the unc. due to bootstrapping