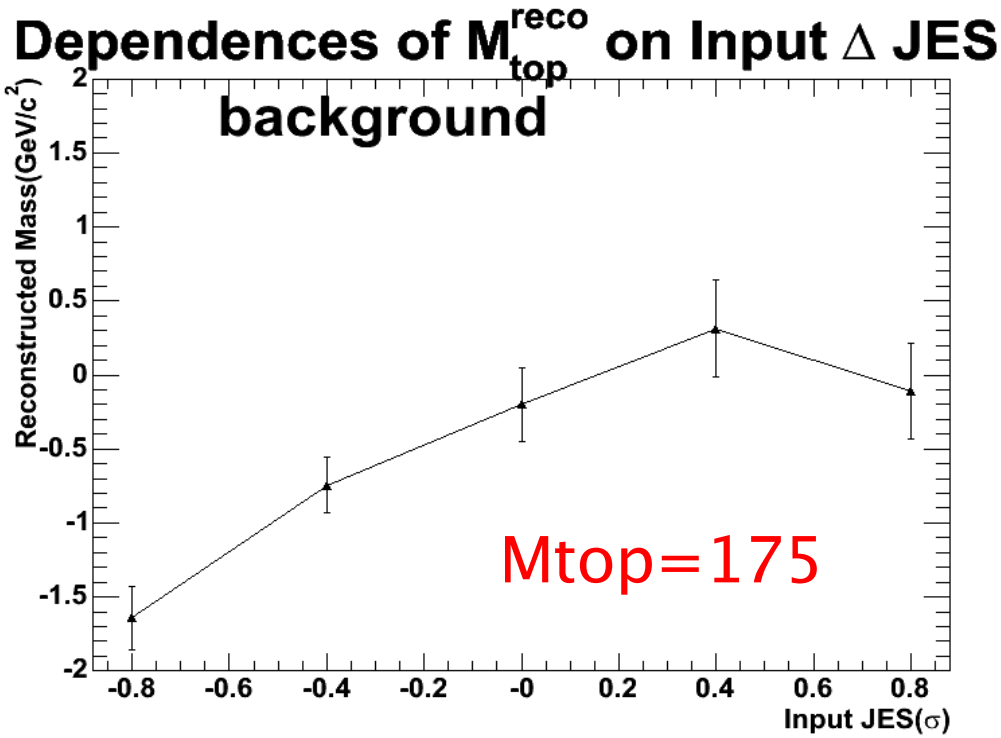
Top mass measurement in lepton+jets channel with DLM update

Taichi Kubo
J.Naganoma
S.Kim
K.Kondo

Mtop Dependence on input JES

We checked the Mtop Dependences on input JES.

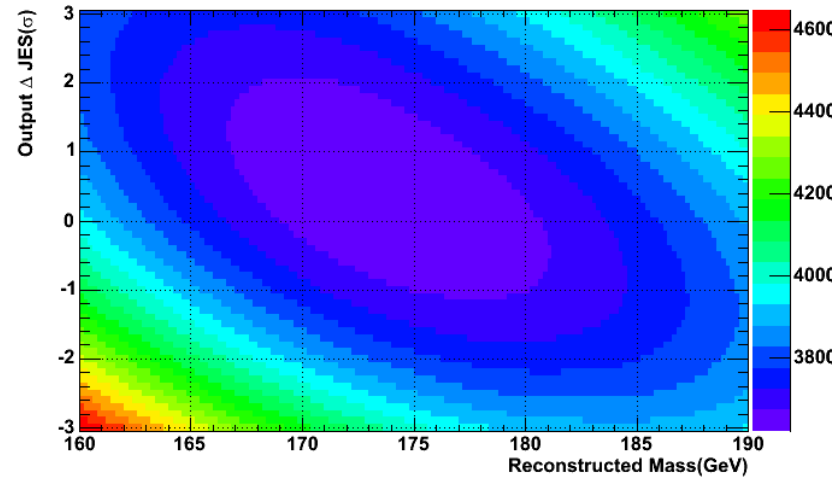


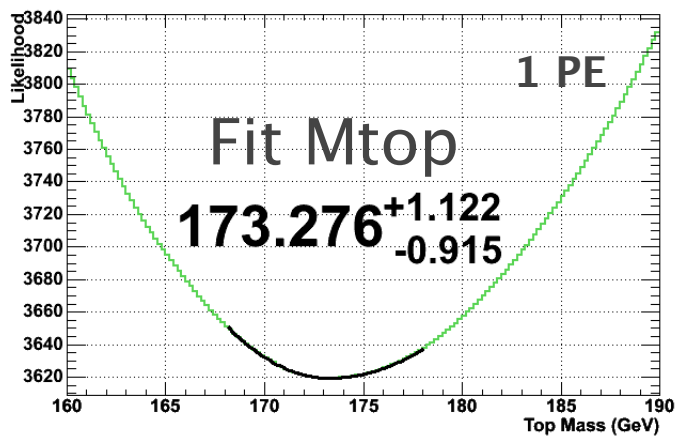
Reconstructed Mtop is not independent on input JES
-> We have to rethink the fit of likelihood

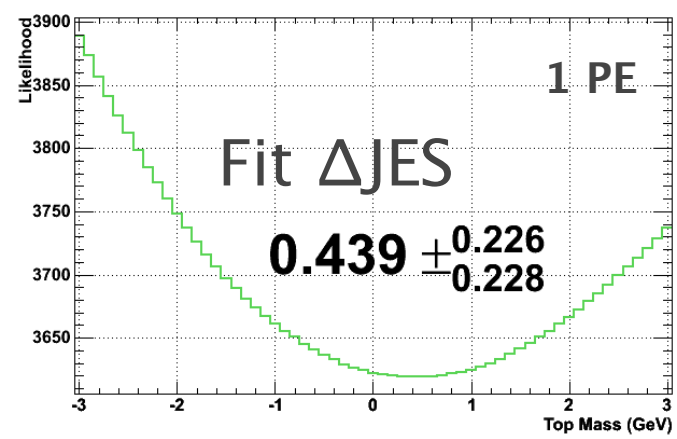
Old Likelihood Fit(Remainder)

- How do we fit Mtop?
  - Search minimum χ^2 in all JES values.
    $\chi^2(\text{Mtop}) = \min[\chi^2(\text{Mtop, JES}), -3<\Delta\text{JES}<3]$
  - Fit χ^2(Mtop) with asymmetric quadratic function.
- How do we fit JES?
  - Search minimum χ^2 in all Mtop values.
    $\chi^2(\text{JES}) = \min[\chi^2(\text{Mtop, JES}), 160<\text{Mtop}<190]$
  - Fit χ^2(JES) with asymmetric quadratic function.

Example of Likelihood in a PE





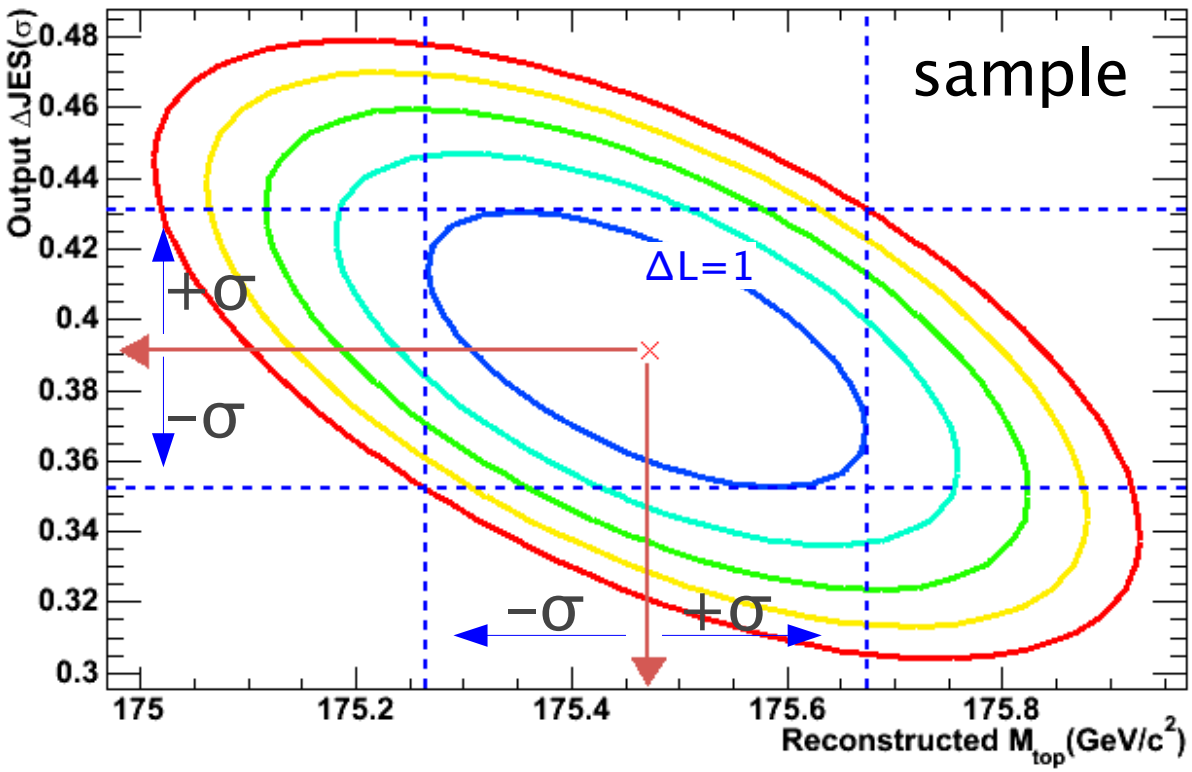


This fit determines Mtop and JES independently!
This fit could take different minimum points for Mtop and JES

2D Likelihood Fit

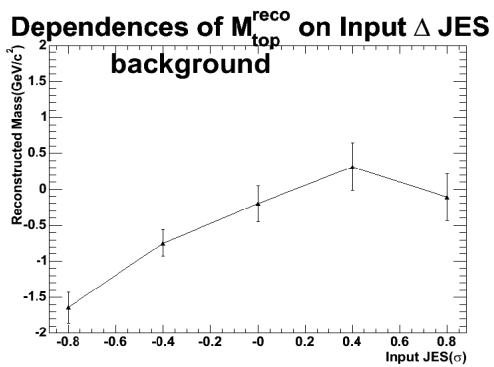
To fit Mtop and JES simultaneously, we introduce 2D function
New fit function:

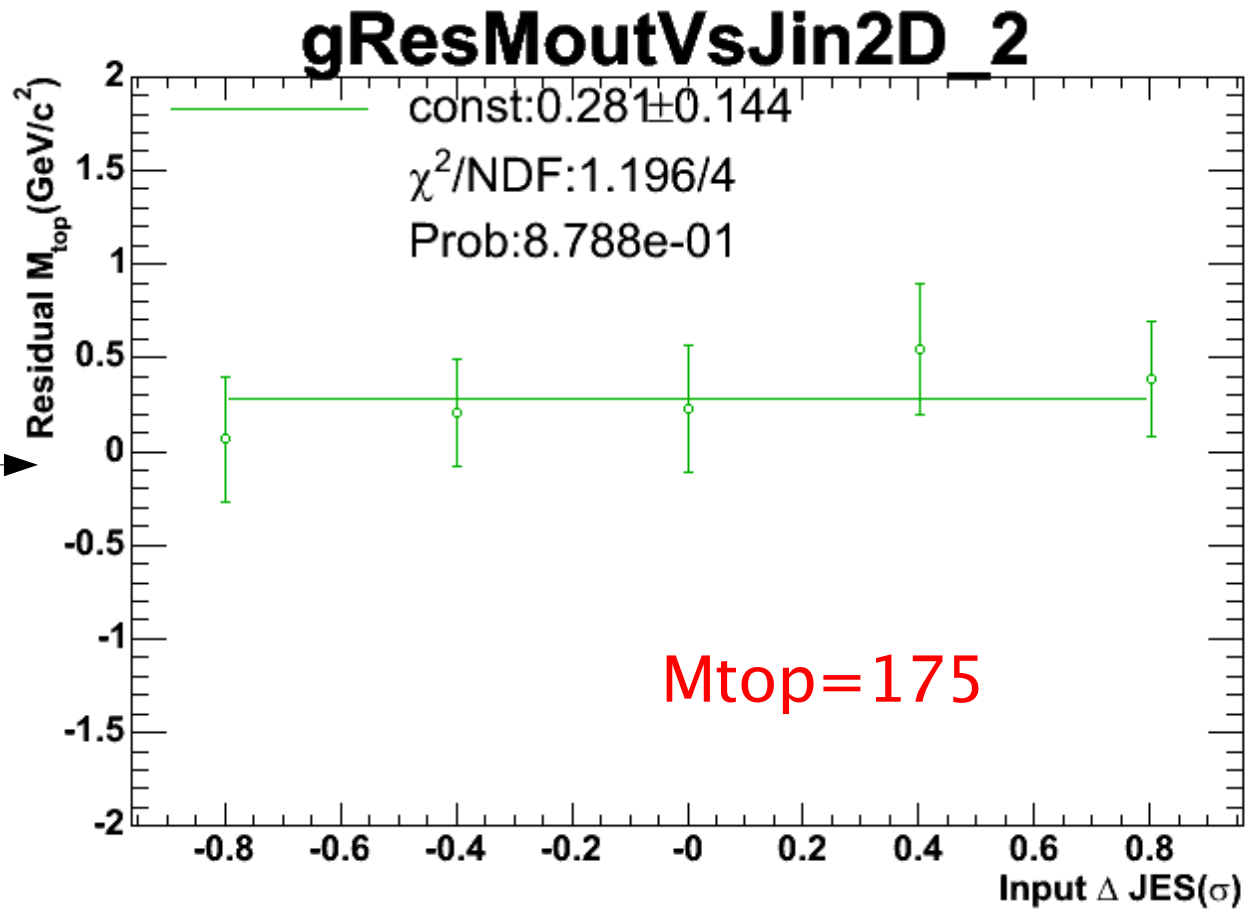
$$f(x,y) = ax^2+by^2+cxy+dx+ey+f$$



Mtop Dependences on input JES

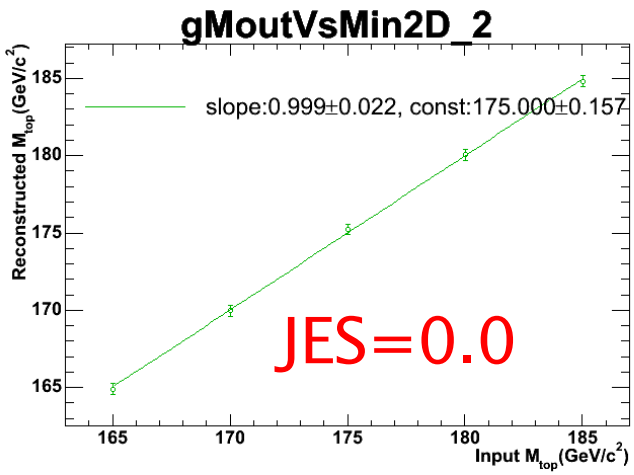
The results of PE's with new fitting

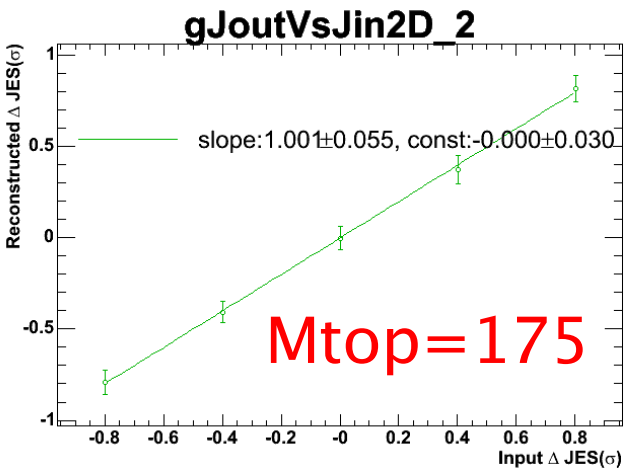


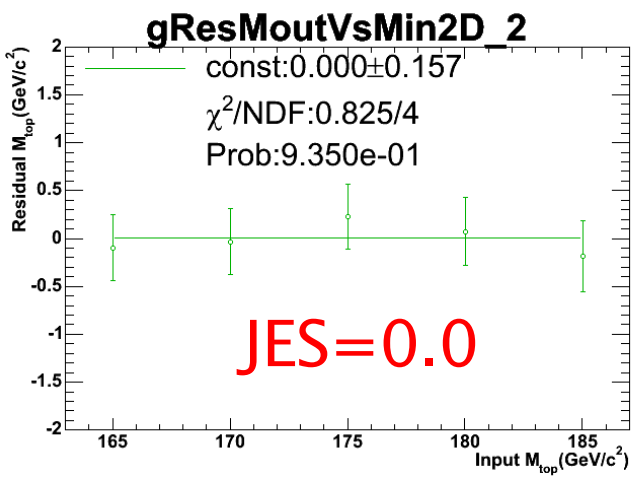


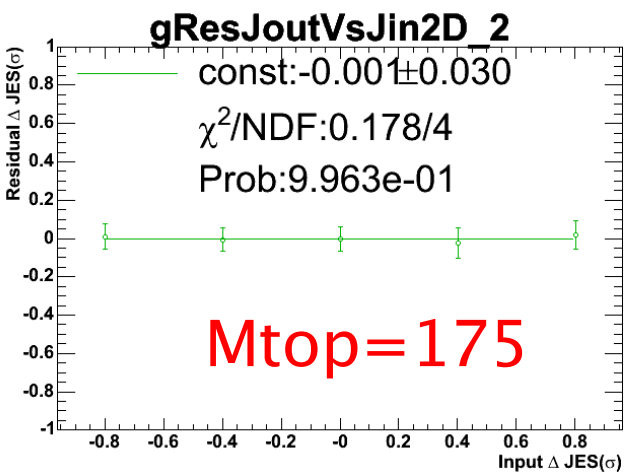
Reconstructed Mtop is independent on input JES!

Linearities and Residuals









Linearities and Residuals are look good

Summary

- To fit Mtop and JES independently is not good.
- We introduced 2D fitting function like
  $f(x, y) = ax^2+by^2+cxy+dx+ey+f$
- Mtop is not depend on input JES
- Linearities and Residuals are look good