Top mass measurement in lepton+jets channel with DLM 2D mapping function

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2D mapping function

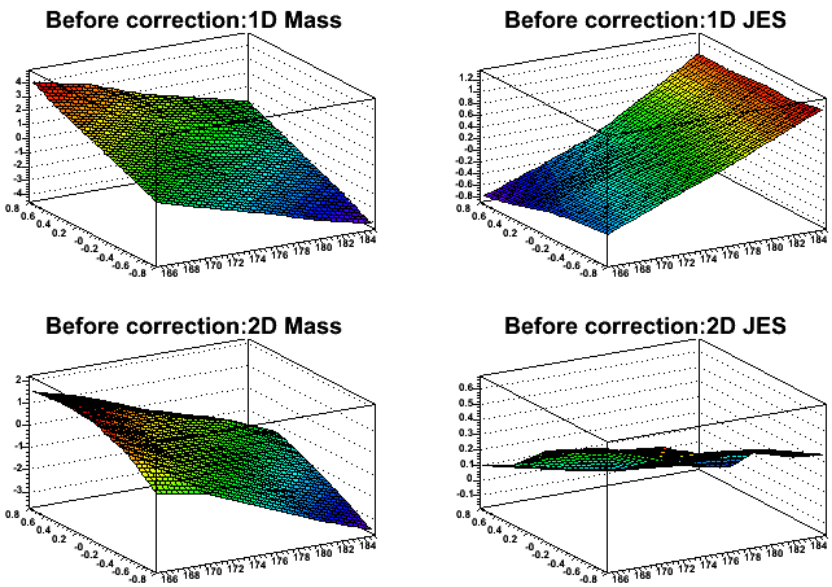
Since Mtop and JES cannot be corrected independently, introduce 2D mapping function.

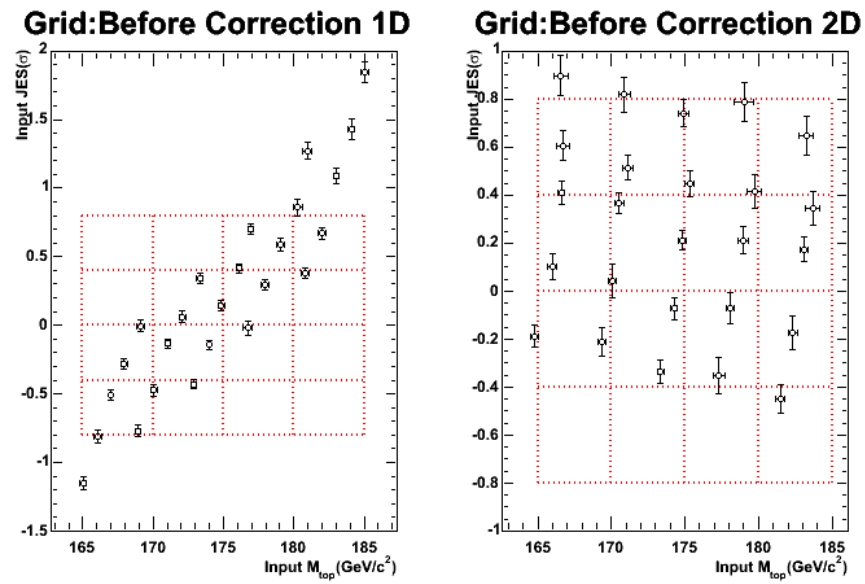
$x' = ax + by + c$
$y' = dx + ey + f$
->
$x = Ax' + By' + C$
$y = Dx' + Ey' + F$

x: input Mtop
y: input JES
x': output Mtop
y': output JES

Reconstructed Mtop and JES

Signal and Background
Full realistic case





Fit with 2D function!

$$x' = ax + by + c$$
$$y' = dx + ey + f$$

Fit Results

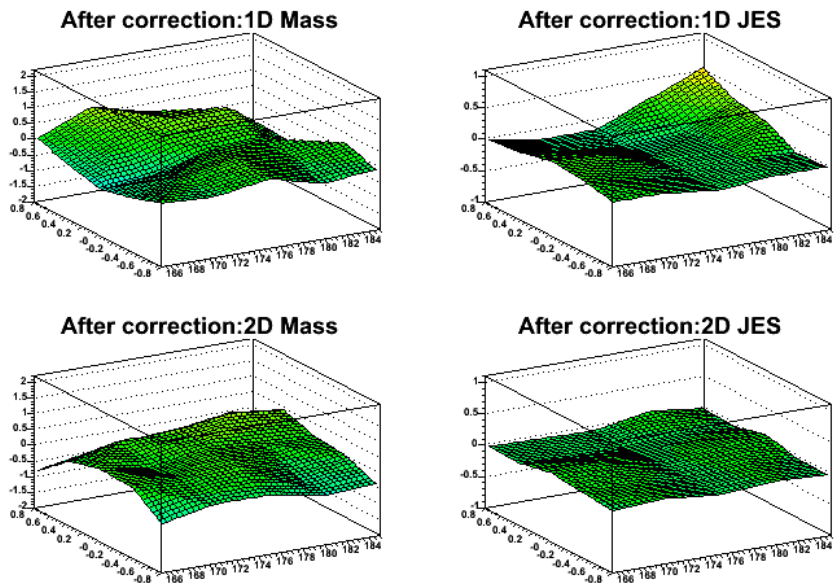
2D mapping function with 1D likelihood
a=0.796962
b=2.60244
c=35.5422
d=0.0782752
e=0.732389
f=-13.5019

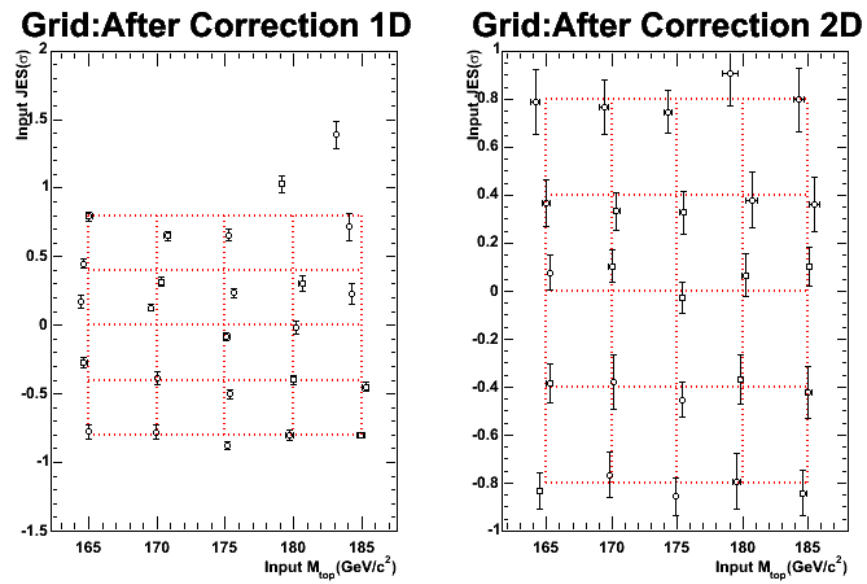
2D mapping function with 2D likelihood
a=0.828114
b=1.25757
c=29.6321
d=-0.0126634
e=0.667191
f=2.45056

Corrected Mtop and JES

Correction by 2D mapping function

Residuals





Fit with 2D plane

(a, b, c, d, e, f) :

1D likelihood (-0.0259, -1.267, 4.081, -0.00318, -0.0409, 0.539)

2D likelihood (-8.38e-05, 0.00311, 0.0279 9.61e-08, -0.000224, -0.000276)