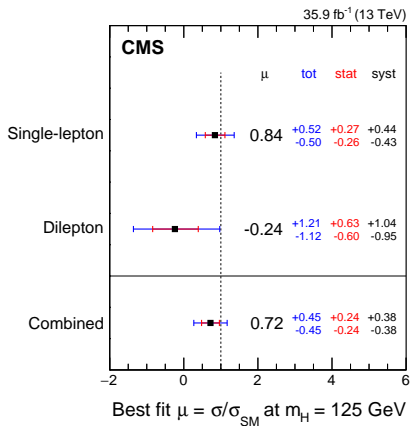
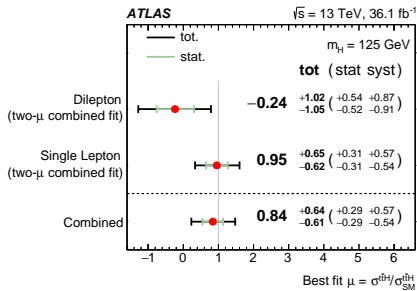


# Results



Combined with all-had:  $0.82^{+0.44}_{-0.42}$

# Post-Fit Uncertainties

## ATLAS

Uncertainty source	$\Delta\mu$	
$t\bar{t} + \geq 1b$ modeling	+0.46	-0.46
Background-model stat. unc.	+0.29	-0.31
$b$ -tagging efficiency and mis-tag rates	+0.16	-0.16
Jet energy scale and resolution	+0.14	-0.14
$t\bar{t}H$ modeling	+0.22	-0.05
$t\bar{t} + \geq 1c$ modeling	+0.09	-0.11
JVT, pileup modeling	+0.03	-0.05
Other background modeling	+0.08	-0.08
$t\bar{t} +$ light modeling	+0.06	-0.03
Luminosity	+0.03	-0.02
Light lepton ( $e, \mu$ ) id., isolation, trigger	+0.03	-0.04
Total systematic uncertainty	+0.57	-0.54
$t\bar{t} + \geq 1b$ normalization	+0.09	-0.10
$t\bar{t} + \geq 1c$ normalization	+0.02	-0.03
Intrinsic statistical uncertainty	+0.21	-0.20
Total statistical uncertainty	+0.29	-0.29
Total uncertainty	+0.64	-0.61

## CMS

Uncertainty source	$\pm\Delta\mu$ (observed)	$\pm\Delta\mu$ (expected)
Total experimental	+0.15/-0.16	+0.19/-0.17
<b>b tagging</b>	+0.11/-0.14	+0.12/-0.11
jet energy scale and resolution	+0.06/-0.07	+0.13/-0.11
Total theory	+0.28/-0.29	+0.32/-0.29
$t\bar{t}$ +hf cross section and parton shower	+0.24/-0.28	+0.28/-0.28
Size of the simulated samples	+0.14/-0.15	+0.16/-0.16
Total systematic	+0.38/-0.38	+0.45/-0.42
Statistical	+0.24/-0.24	+0.27/-0.27
Total	+0.45/-0.45	+0.53/-0.49

# Nuisance Parameter Pulls & Impacts

Pre-fit impact on  $\mu$ :

$\square \theta = \hat{\theta} + \Delta\theta$   $\square \theta = \hat{\theta} - \Delta\theta$



Post-fit impact on  $\mu$ :

$\blacksquare \theta = \hat{\theta} + \Delta\hat{\theta}$   $\blacksquare \theta = \hat{\theta} - \Delta\hat{\theta}$

—●— Nuis. Param. Pull

$t\bar{t} \rightarrow \geq 1b$ : SHERPA5F vs. nominal

$t\bar{t} \rightarrow \geq 1b$ : SHERPA4F vs. nominal

$t\bar{t} \rightarrow \geq 1b$ : PS & hadronization

$t\bar{t} \rightarrow \geq 1b$ : ISR / FSR

$t\bar{t}H$ : PS & hadronization

b-tagging: mis-tag (light) NP I

$k(t\bar{t} \rightarrow \geq 1b) = 1.24 \pm 0.10$

Jet energy resolution: NP I

$t\bar{t}H$ : cross section (QCD scale)

$t\bar{t} \rightarrow \geq 1b$ :  $t\bar{t} \rightarrow \geq 3b$  normalization

$t\bar{t} \rightarrow \geq 1c$ : SHERPA5F vs. nominal

$t\bar{t} \rightarrow \geq 1b$ : shower recoil scheme

$t\bar{t} \rightarrow \geq 1c$ : ISR / FSR

Jet energy resolution: NP II

$t\bar{t} \rightarrow \text{light}$ : PS & hadronization

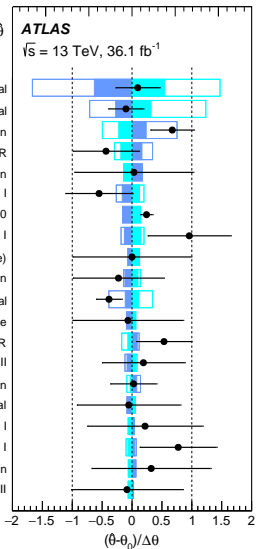
Wt: diagram subtr. vs. nominal

b-tagging: efficiency NP I

b-tagging: mis-tag (c) NP I

$E_T^{\text{miss}}$ : soft-term resolution

b-tagging: efficiency NP II



**CMS Supplementary**

$35.9 \text{ fb}^{-1} (13 \text{ TeV})$

