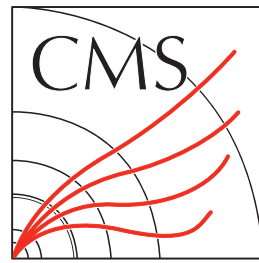


Jet Cones With Top Flavour

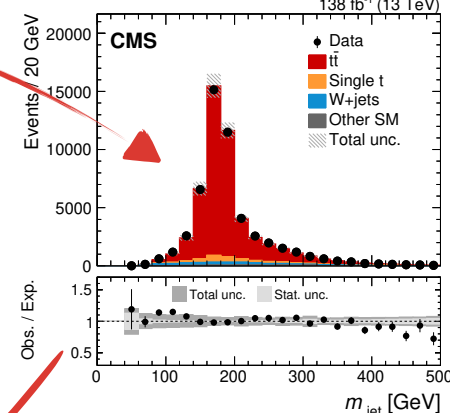
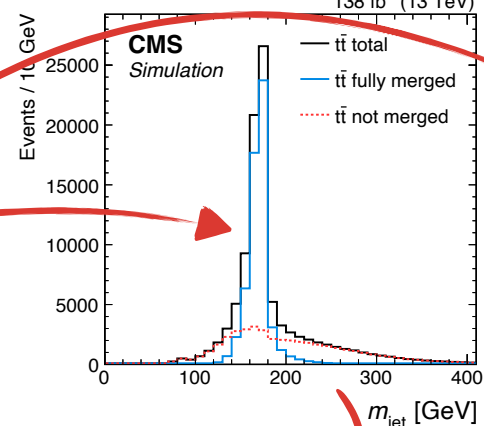
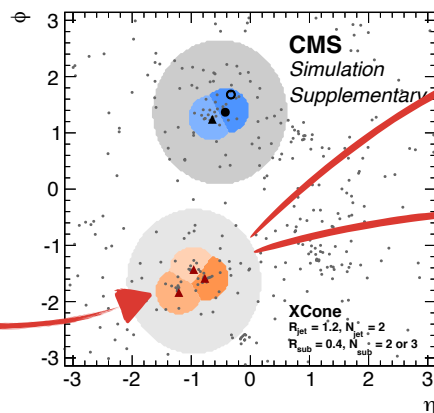
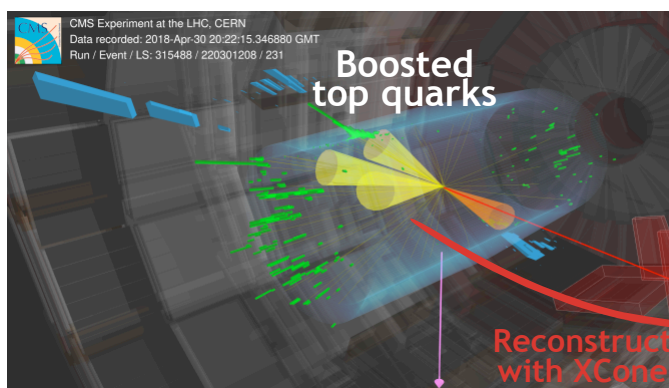


Measurement of the jet mass and top quark mass in hadronic decays of boosted top quarks with CMS

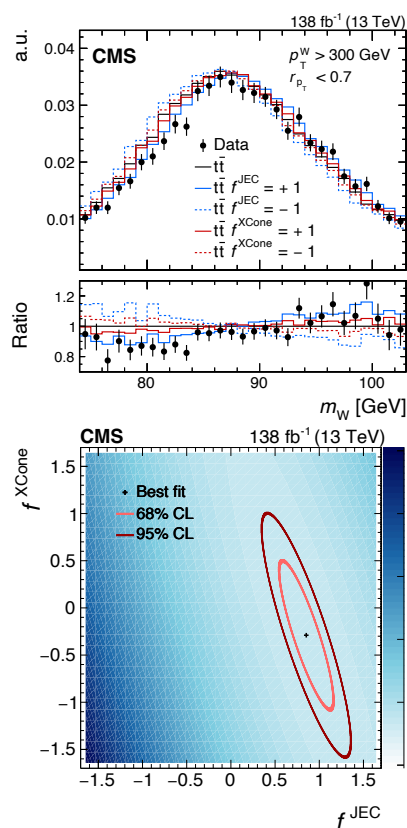
R. Kogler, A. Paasch, D. Schwarz on behalf of the CMS Collaboration

Reconstruction with XCone

- Fully merged top decays contained in $R=1.2$ jets with $p_T > 400$ GeV
- Improves width of lineshape and experimental resolution
- Reduces pileup effects

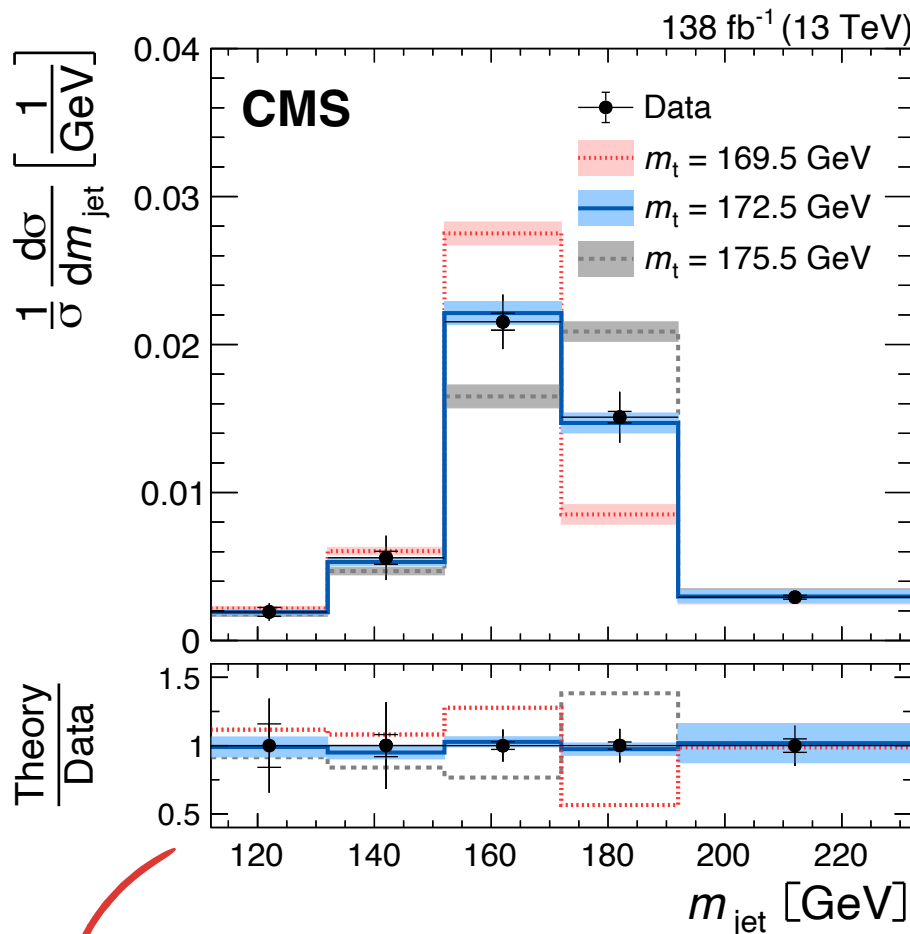


Jet Mass Calibration



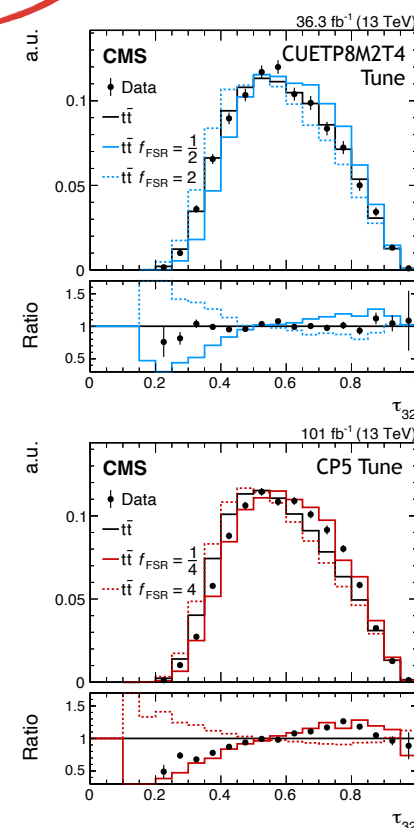
- Reconstruct m_W using the two light-flavoured subjets
- Measure m_W in four regions: $p_T < \text{or} > 300$ GeV and $r_{PT} < \text{or} > 0.7$ (r_{PT} is the leading subjet p_T -fraction)
- Measure jet mass scale (JMS) using XCone and jet energy scale corrections

Unfolded Measurement



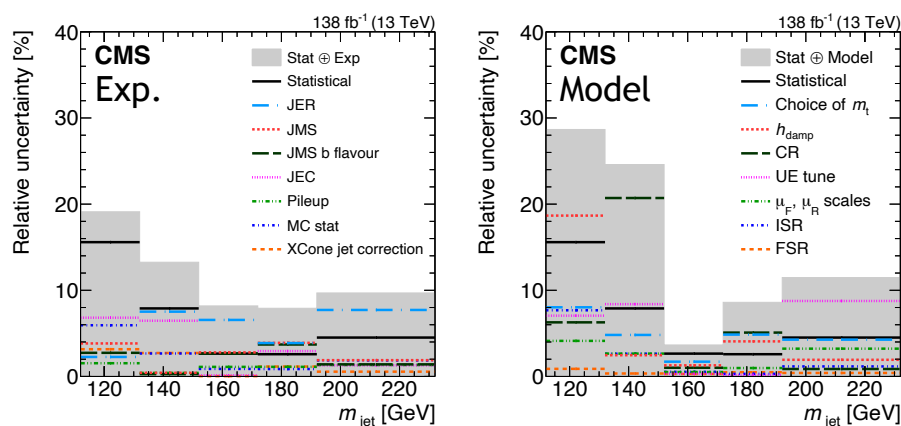
- Normalised jet mass: high sensitivity to m_t
- Reduction of uncertainties: factor of three w.r.t. earlier measurement

Modelling



- Large uncertainty from modelling of final state radiation (FSR)
- Constrain FSR by measuring N -subjettiness ratio $\tau_{32} = \tau_3/\tau_2$
- Adjust f_{FSR} in $\alpha_S^{FSR}(f_{FSR} \mu_0)$, equivalent to choosing different $\alpha_S^{FSR}(M_Z)$

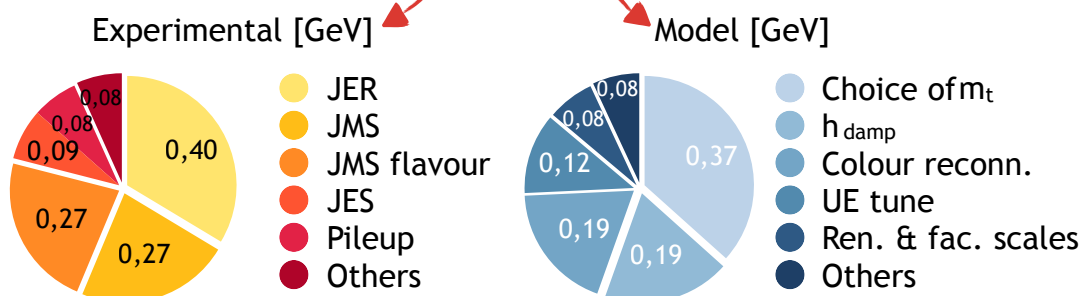
Uncertainties



Top Quark Mass

$$m_t = 172.76 \pm 0.81 \text{ GeV}$$

$$\pm 0.22 \text{ (stat)} \pm 0.57 \text{ (exp)} \pm 0.48 \text{ (model)} \pm 0.24 \text{ (theo)} \text{ GeV}$$



More Information:
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Submitted to EPJC

