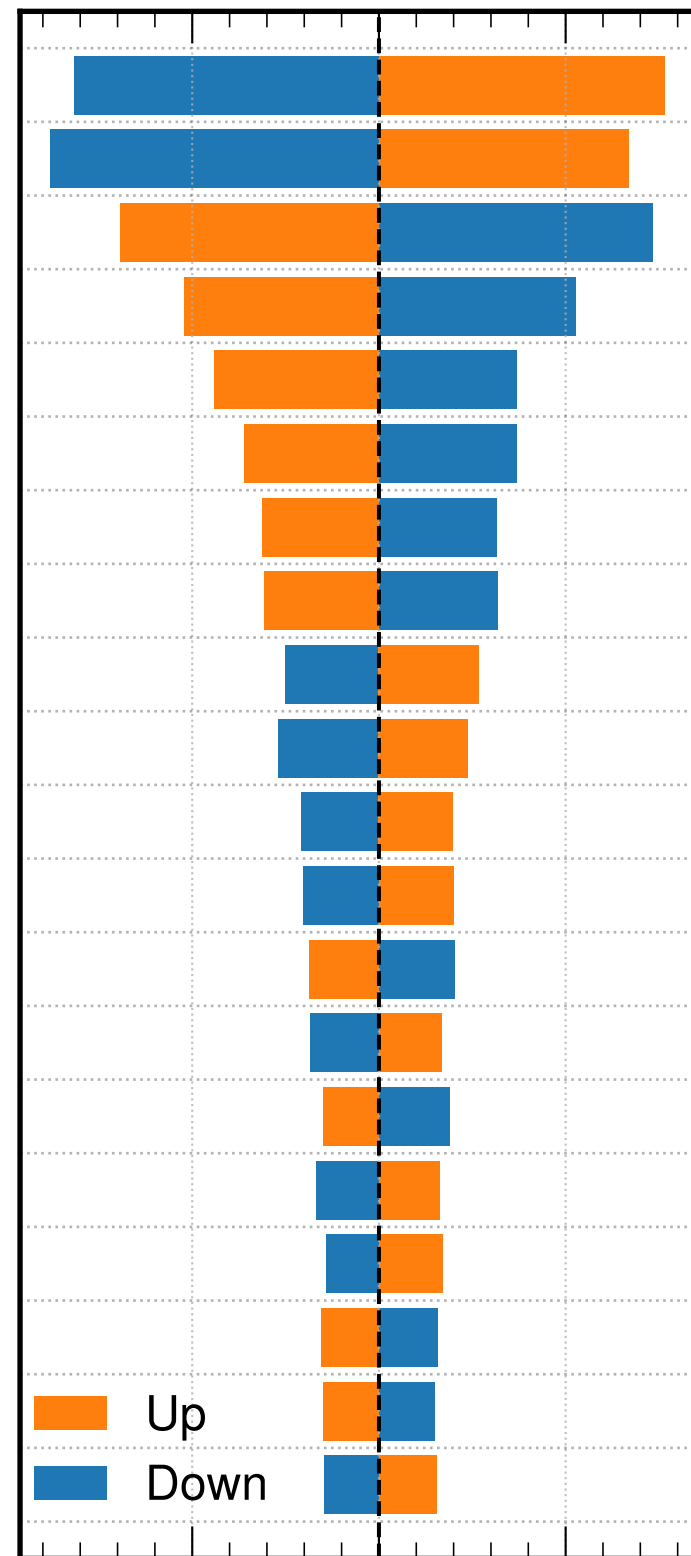
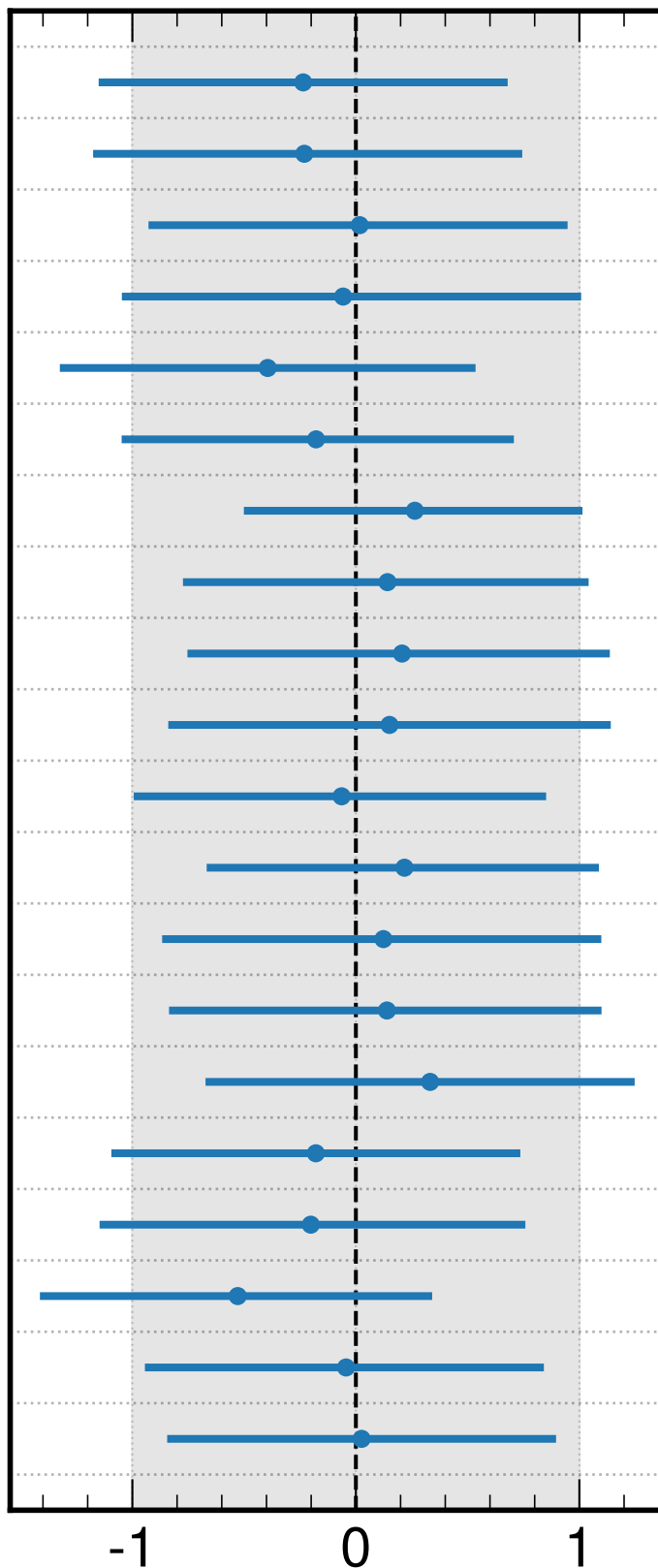


# CMS

# 138 fb<sup>-1</sup> (13 TeV)

- 1 – Renormalization scale norm (t $\bar{t}$ b OOA)
- 2 – Renormalization scale norm (t $\bar{t}$ b $\bar{b}$  OOA)
- 3 – b tagging (b jets, calibration methods)
- 4 – Jet energy scale (Absolute)
- 5 – Colour reconnection (CR2)
- 6 – Renormalization scale (t $\bar{t}$ )
- 7 – b tagging (b jets, tight WP, 2017)
- 8 – b tagging (b jets, tight WP, 2018)
- 9 – t $\bar{t}$ C norm
- 10 – Factorization scale (t $\bar{t}$ B)
- 11 – b tagging (light jets, medium WP 2018)
- 12 – Renormalization scale (t $\bar{t}$ B)
- 13 – Colour reconnection (QCD based)
- 14 – h<sub>damp</sub>(t $\bar{t}$ )
- 15 – h<sub>damp</sub>(t $\bar{t}$ bOOA)
- 16 – b tagging (b jets, medium WP, 2018)
- 17 – Factorization scale (t $\bar{t}$ b OOA)
- 18 – b tagging (b jets, tight WP, 2016preVFP)
- 19 – b tagging (b jets, tight WP, 2016postVFP)
- 20 – b tagging (light jets)



Phase space:  $\geq 7$  jets:  $\geq 4b$ ,  $\geq 3$  light  
Observable:  $|\Delta\phi(lj_1^{\text{extra}}, b_{\text{soft}})|$