

# ttX studies for the HL/HE-LHC

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CERN TH

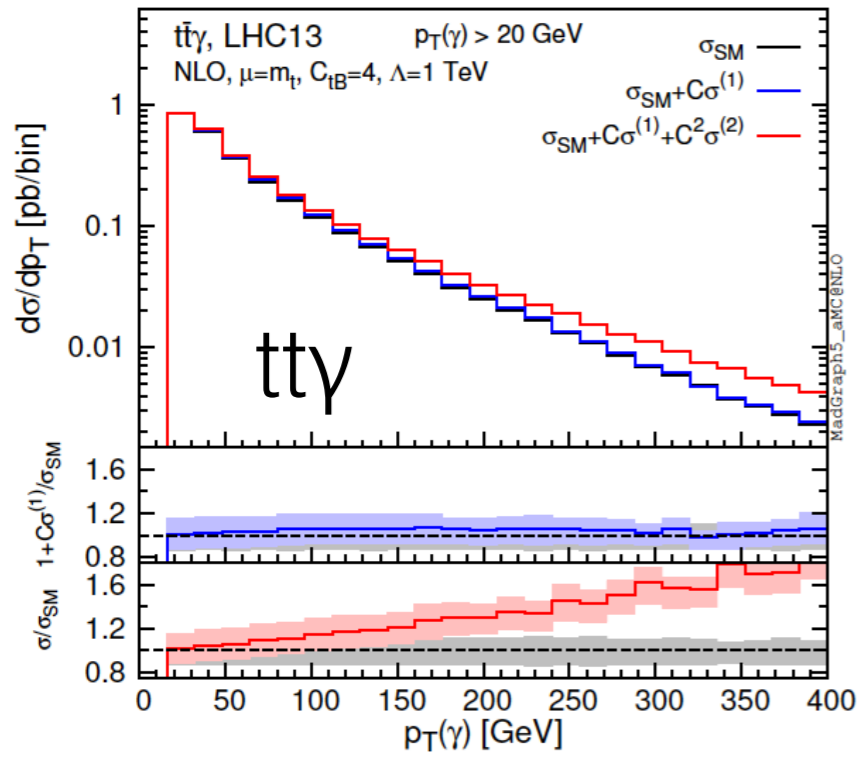


ttX group:  
Y. Li, A. Onofre, M. Llacer (ATLAS)  
R. Schoefbeck (CMS)  
E.Vryonidou (Theory)

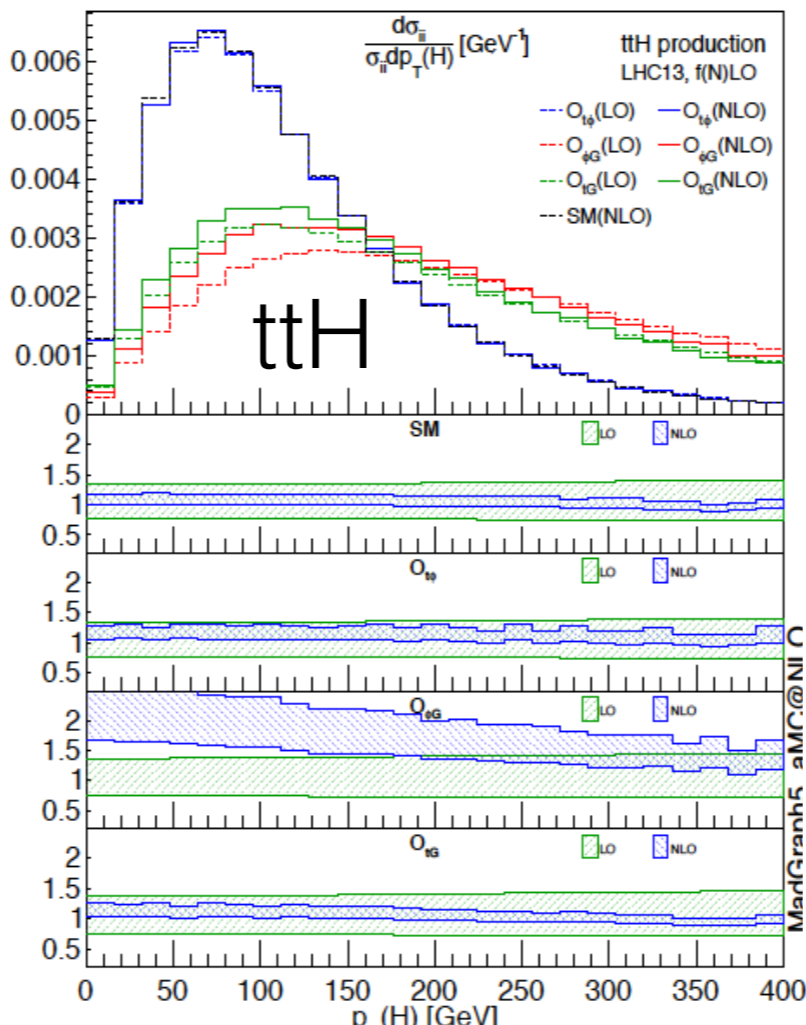
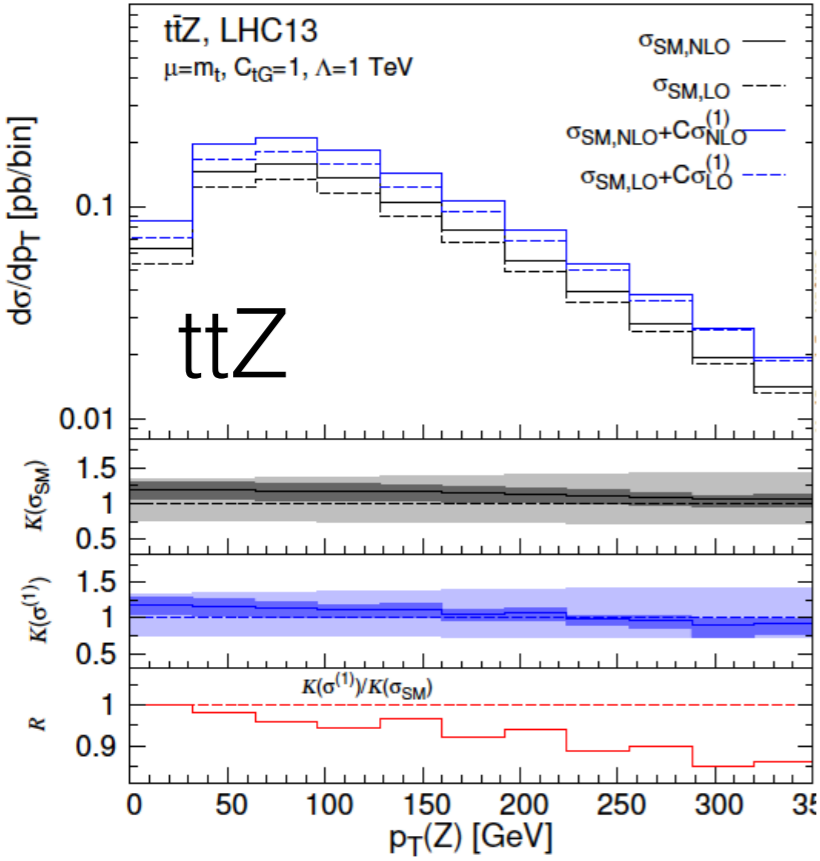
HL/HE-LHC  
WG1  
2/5/18

From February meeting:

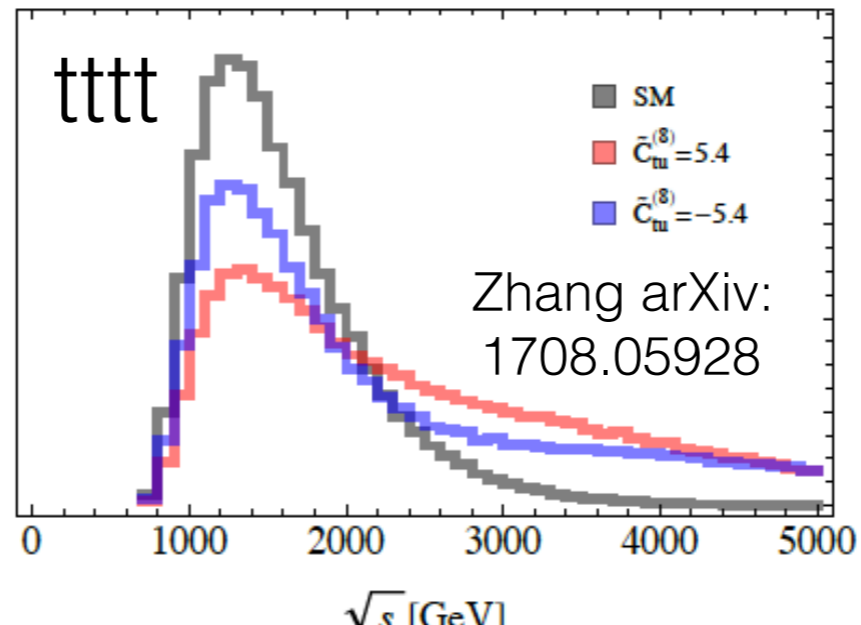
# HL/HE-LHC prospects



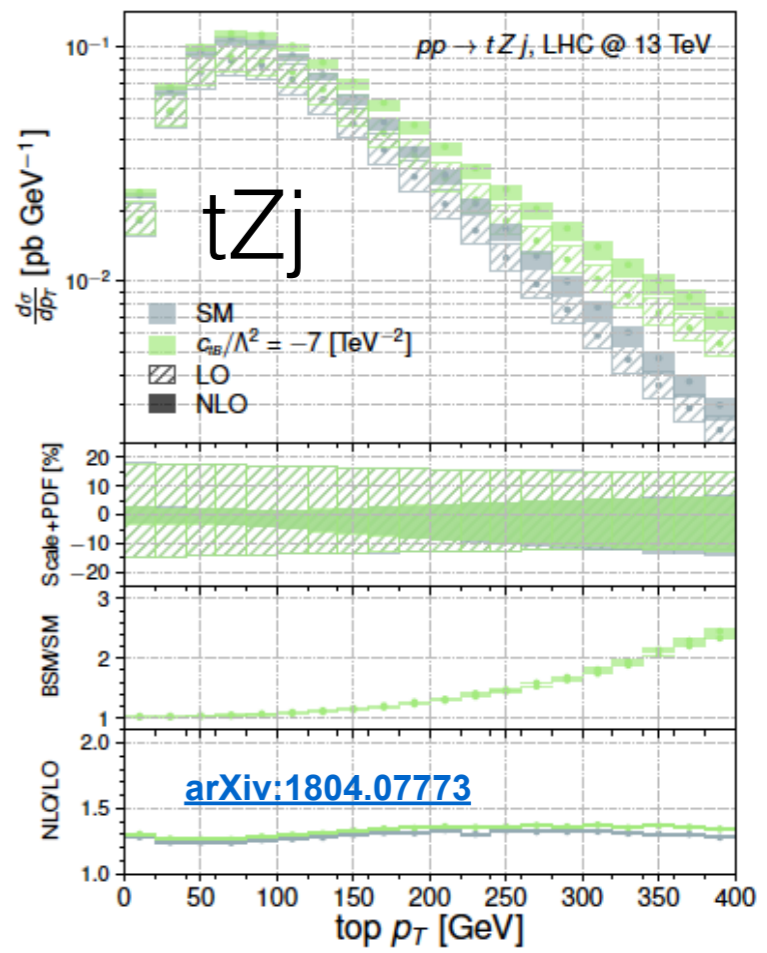
arXiv:1601.08193



arXiv:1607.05330



Zhang arXiv: 1708.05928



arXiv:1804.07773

Importance of differential measurements in particular for high threshold processes  $ttV$ ,  $ttH$ ,  $tttt$ ,  $tZj$  for HL/HE-LHC

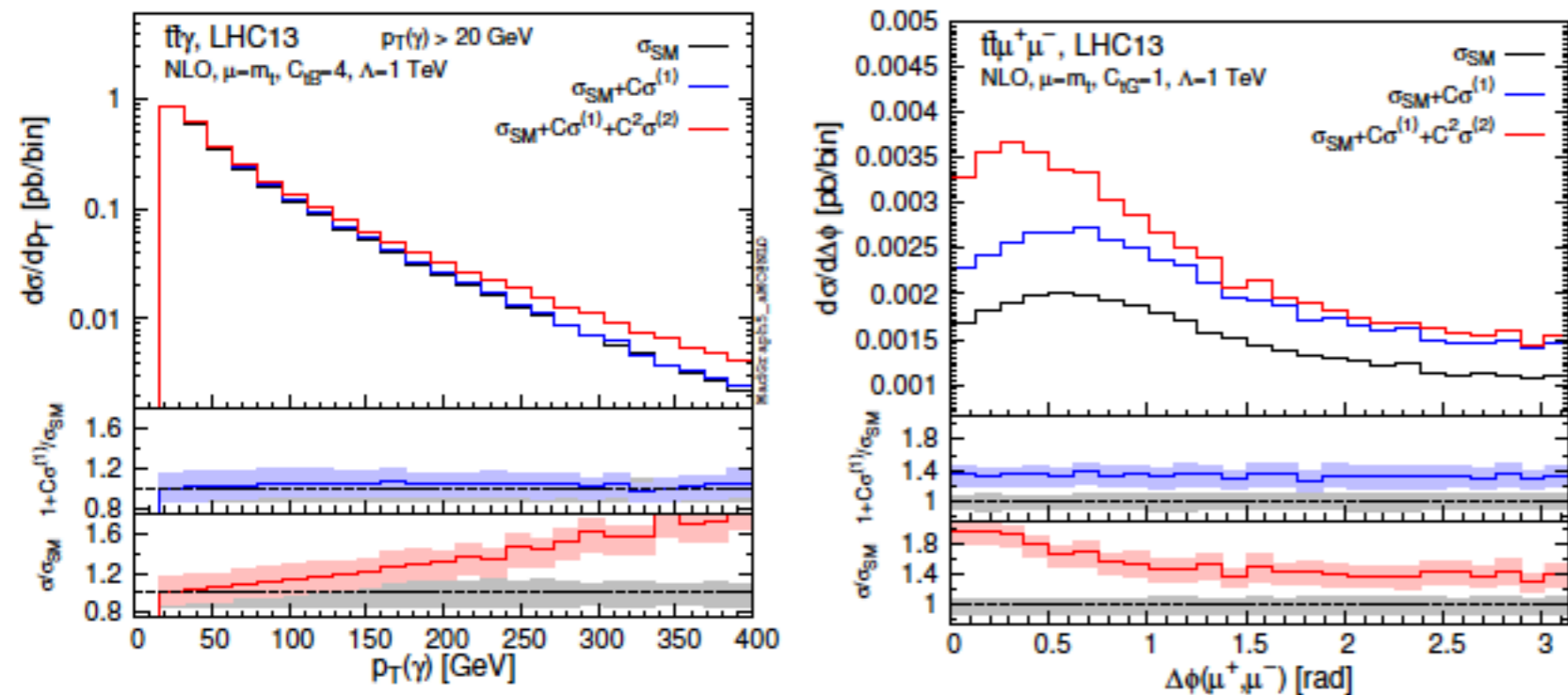
From February meeting:

# Plans for HL/HE-LHC report?

- Provide benchmark EFT cross-sections for HE-LHC
- Investigate EFT effects in distributions for rare processes
- Combine LHC13 predictions with HL-LHC projections to extract potential sensitivities-Work closely with experimentalists

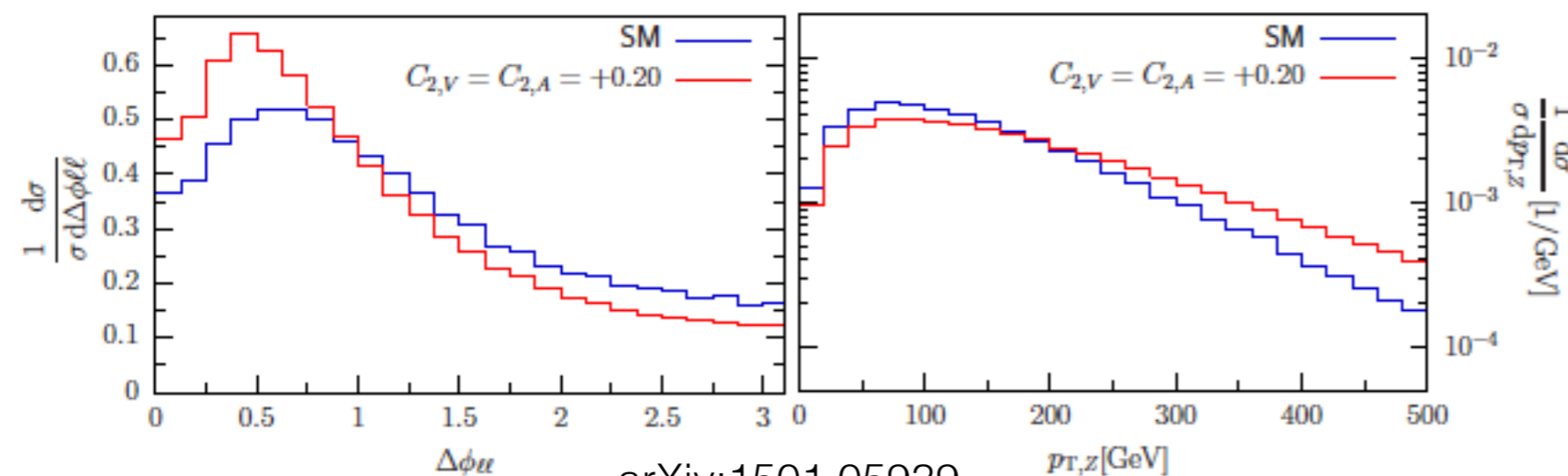
# ttV plans for HL-LHC

Focus on ttV: probe of top-Z and top-gamma couplings  
Pheno studies:

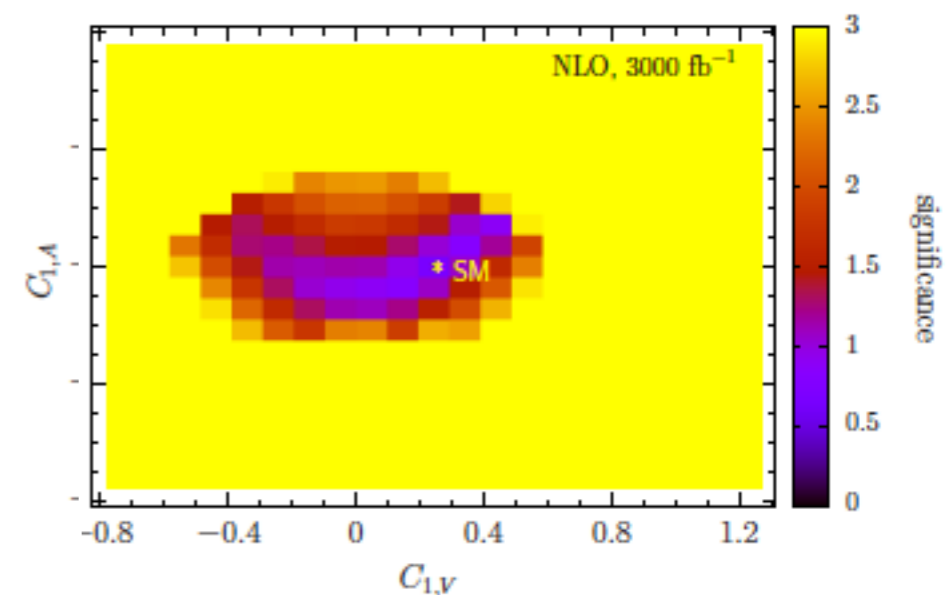


arXiv:1601.08193

Pheno studies already demonstrating the importance of differential information



arXiv:1501.05939



# ttV plans for HL-LHC

From the ATLAS and CMS analysis groups

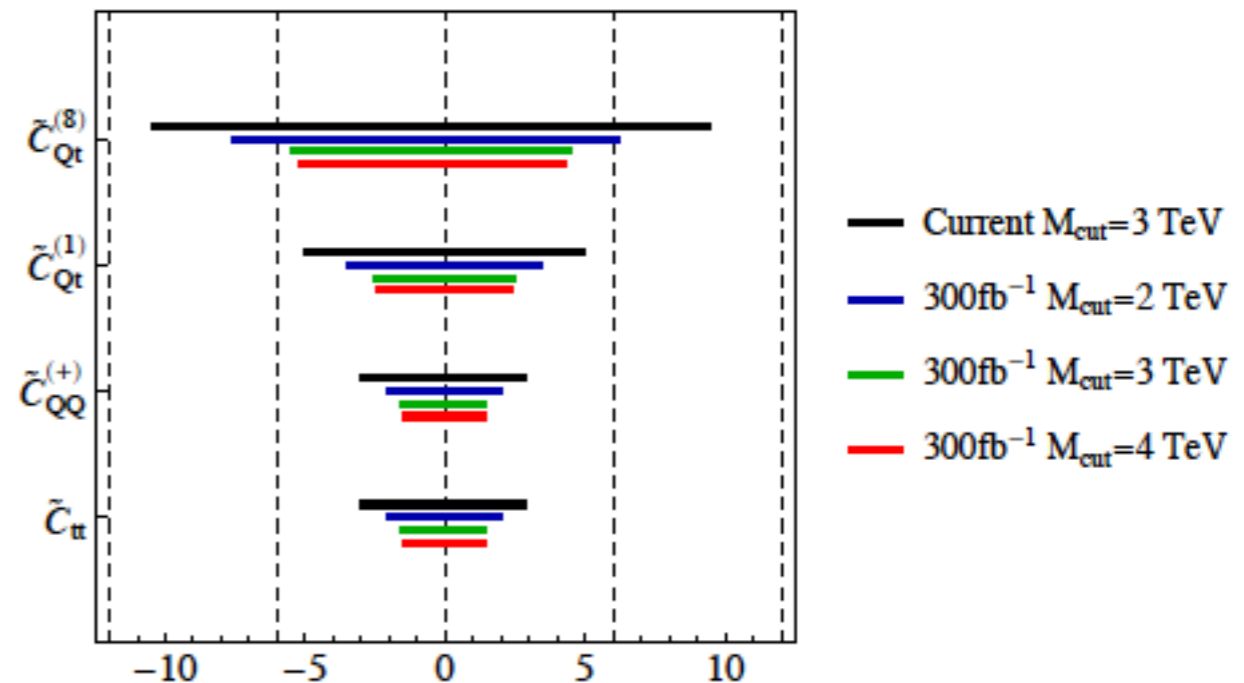
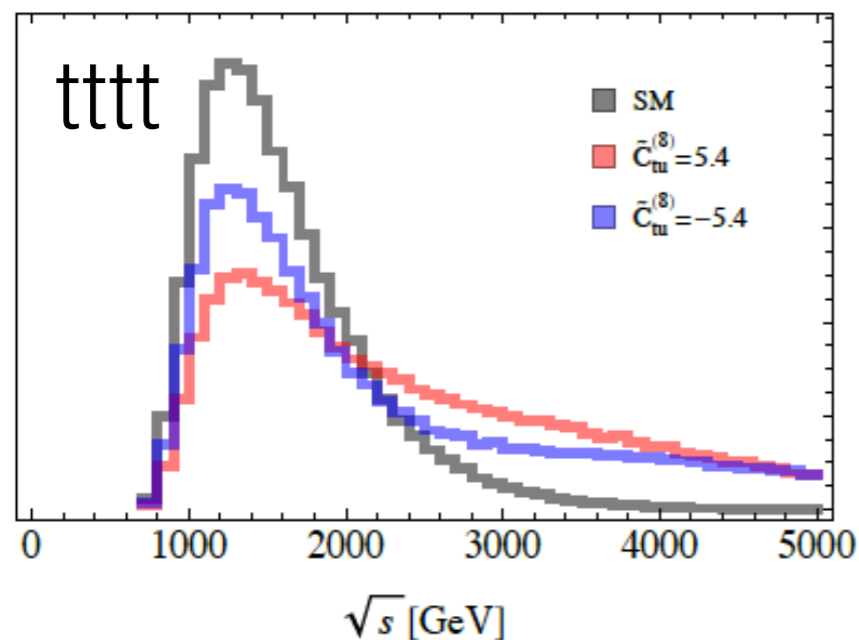
ATLAS and CMS teams agreed to show

- projections of ttZ and ttGamma final states
- show differential distributions, if possible unfolded to particle level
- obtain projections of EFT sensitivity for HL-LHC scenarios
- follow common prescriptions for uncertainties
- using  $p_T(\text{Z/Gamma})$  and  $\Delta\Phi(\text{ll})$
- split in 3l and 4l channel

**if there are centrally available HE-LHC scenarios,  
will attempt to use them for similar estimates**

# Other EFT directions:

4tops: EFT interpretation of 4top studies:



Zhang arXiv:1708.05928

See Marco's talk

HE-LHC: lacking pheno studies

interested experimental analysis groups welcome to participate

Thank you for your attention