A common $t\bar{t}$ Monte-Carlo sample will facilitate top physics combinations and comparisons for CMS and ATLAS.

Towards Common $t\bar{t}$ Monte-Carlo Settings for ATLAS and CMS

INTRO
- Presenting the improved Powheg+Pythia8 sample (v2): more physical settings.
- Introducing the first common Sherpa sample (v1).
- Comparison with unfolded CMS and ATLAS data is performed (Rivet).

The common sample enables:
- the calculation of correlations between experiments correctly;
- the identification of differences in ATLAS and CMS measurements;
- the use of the sample as a baseline prediction;
- resource sharing for event generation.

The common settings:
- Pow+Pyt: based on Monash-CMW tune with $a_\gamma = 0.118$;
- chosen to improve the agreement with data;
- Sherpa: ATLAS default settings.

RESULTS

$\Delta \phi$ angle between the leptons in the $t\bar{t}$ dilepton channel is sensitive to top spin correlations.

More plots and details in an upcoming ATLAS + CMS note.

The common sample:
- shows a good agreement with the ATLAS and CMS nominal samples and data.
- is ready to be used in analyses (LHE files available).

CONCLUSIONS
The common settings:
- Pow+Pyt: based on Monash-CMW tune with $a_\gamma = 0.118$;
- chosen to improve the agreement with data;
- Sherpa: ATLAS default settings.

Common Pow+Pyt reproduces $N_{\text{jets}}$ in the lepton+jets channel best. Difficult to tune right; a trade-off with $H_T$ and top $p_T$.

A comparison of the main settings for Powheg+Pythia8 and Sherpa

CMS and ATLAS nominal samples:
- CMS: Powheg + Pythia8 (CP5 tune);
- ATLAS: Powheg+Pythia8 (A14 tune) + EvtGen;

Main Sherpa 2.2.11 settings used

Delta phi angle between the leptons in the $t\bar{t}$ dilepton channel is sensitive to top spin correlations.

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More plots and details in an upcoming ATLAS + CMS note.