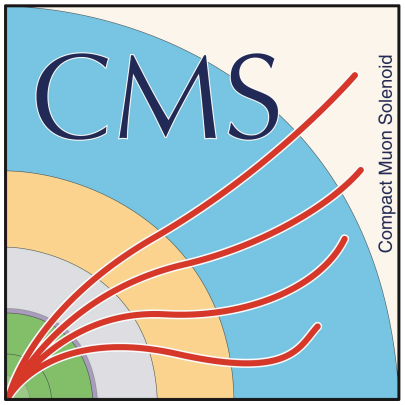

Top Quark Spin Correlations at the HL-LHC & constraining new physics

- *Exploit precision top quark data*

Andreas Jung, Giulia Negro, Amandeep Bakshi

PURDUE UNIVERSITY

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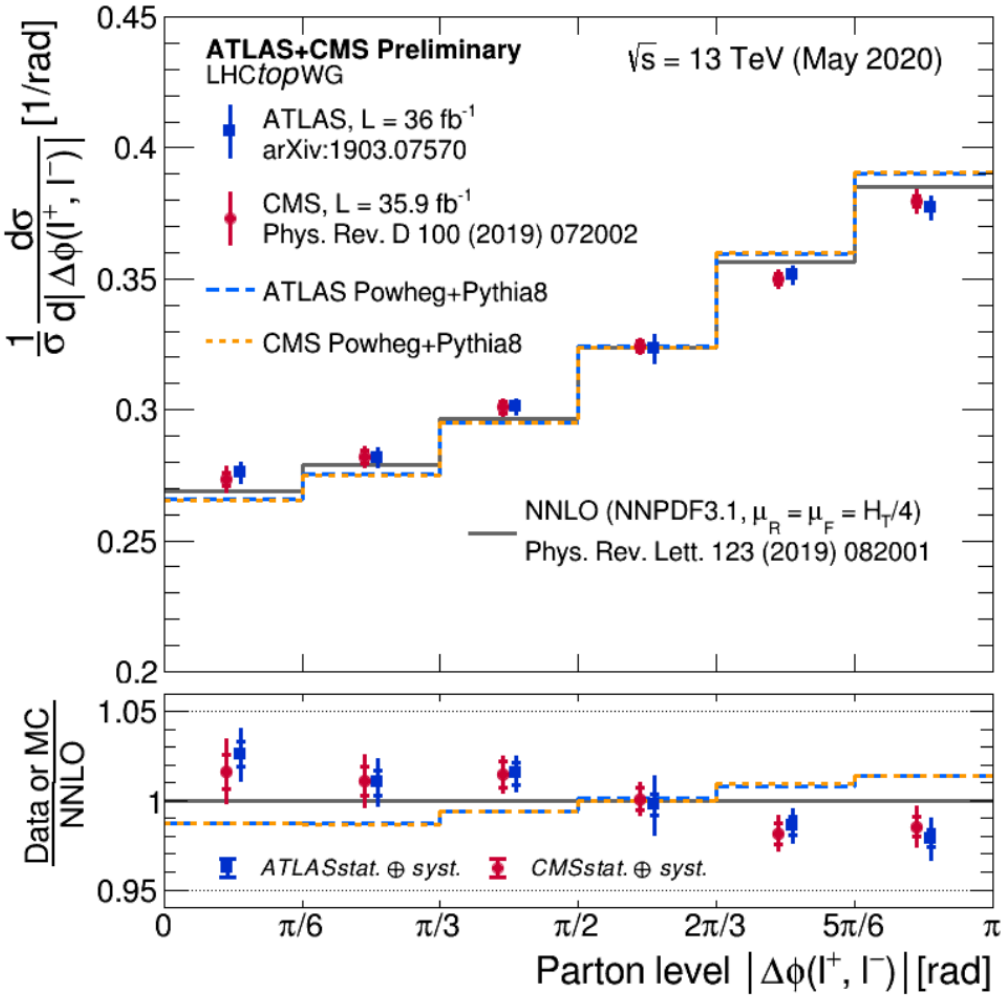
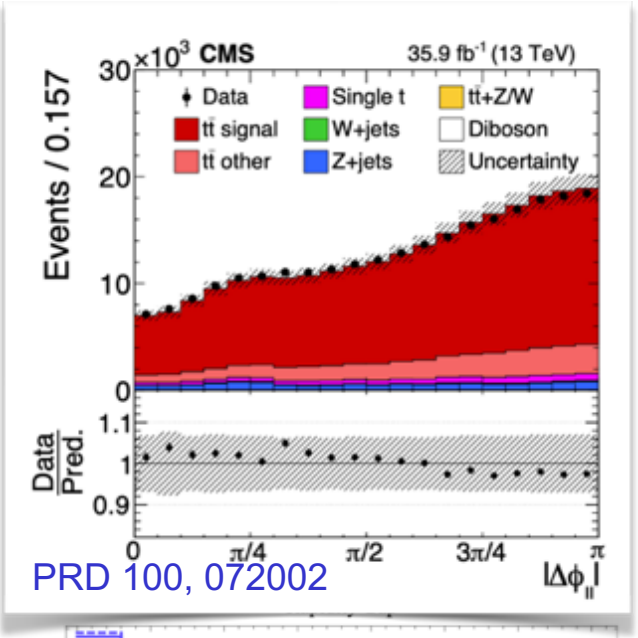
Motivation

- Just released summary plot showing ATLAS & CMS results on spin correlations…
- Tiny snapshot of available information: there is 10's of 1D distributions at ATLAS and CMS & 2D at ATLAS as well



Strategy & Goals

- Employ reco-level distributions to construct discriminant, use MVA on various sensitive distributions
- Unfolding techniques
- Derive projections on how well SUSY, DM, or more generally new physics can be constrained



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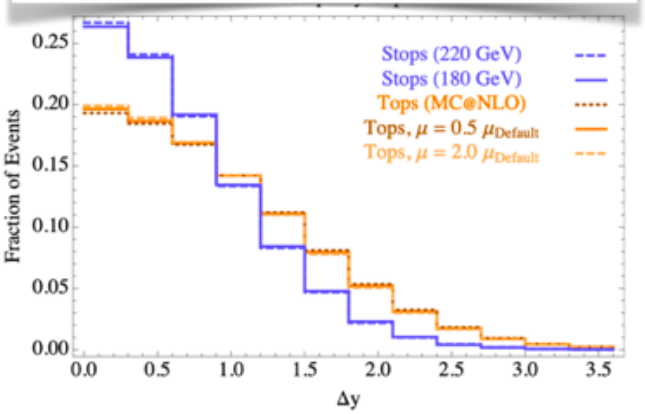

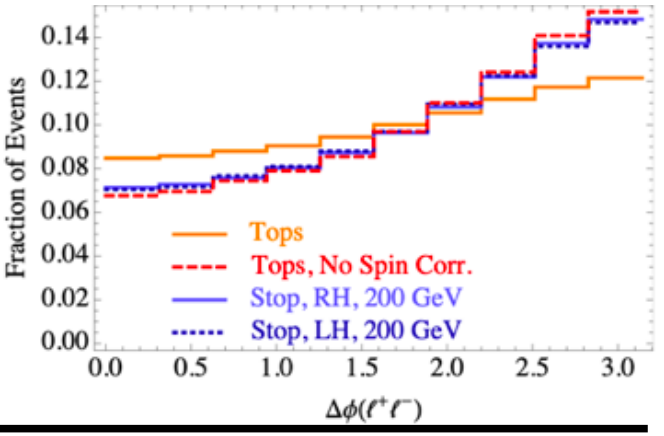

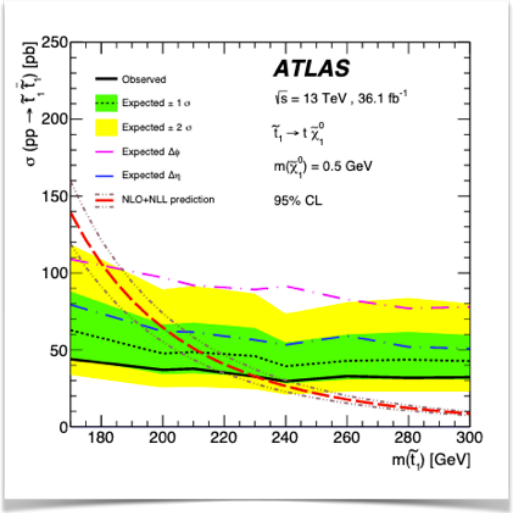

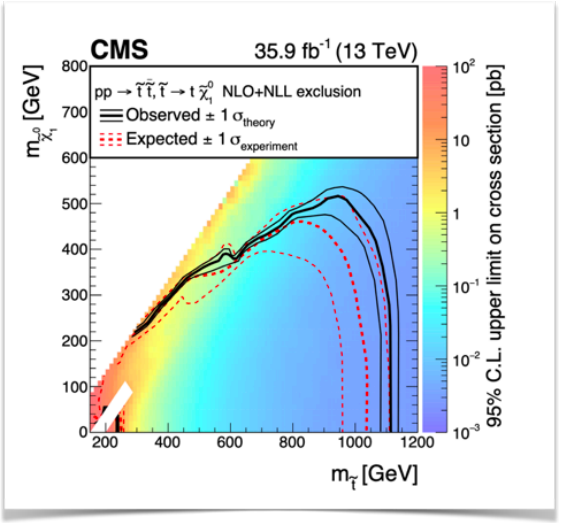

Misc. thoughts

- Currently already in pre-approval stages for the HL-LHC projections, DNN based on 8 sensitive variables, stealth SUSY focus
    - Add new physics constraints via machine learning enhanced EFT, potential to increase sensitivity substantially

- Much relies on delphes samples being centrally provided, is that the plan ?
- Could expand into spin density matrix measurement at other colliders/machines: 100 TeV pp, e+e-, muon
    - Again samples are the likely bottleneck