Azimuthal-angle decorrelation of jets widely separated in rapidity in pp collisions at $\sqrt{s} = 7\ TeV$

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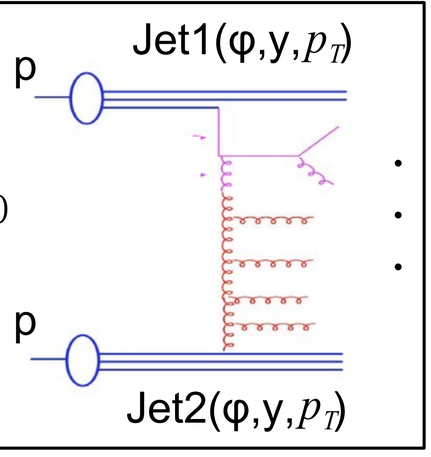
Motivation:

- ✔ Hard parton interactions ($\frac{\sqrt{s}}{2} \sim k_T > \Lambda_{QCD}$) are described by DGLAP evolution equations
- ✔ With increased collision energy semihard parton interaction ($\frac{\sqrt{s}}{2} \gg k_T > \Lambda_{QCD}$) effects became significant, which are described by BFKL evolution equations
- ✔ BFKL contributions are enhanced by $(\alpha_s \Delta y)^n$: Parton cascade is spanned over large rapidity interval
- ✔ **Jets with large rapidity separation provide a sensitive probe for effects beyond DGLAP description**

Event selection and observables:

- Proton-proton at $\sqrt{s}$ = 7 TeV, 2010
- Anti-kT, R = 0.5 jet algorithm
- Jets with p_T > 35 GeV and |y| < 4.7
- Dijets with maximal Δy in event (Mueller-Navelet dijets)
- Observables (unfolded to hadron level):
  - Δφ distributions
  - <cos(n(π - Δφ))>, n = 1,2,3
  - cosines ratios
- Analysis of systematic uncertainties is done



Predictions to compare:

1) LL DGLAP-based MC generators HERWIG++ 2.5, PYTHIA 6 Z2, PYTHIA 8 4C, and SHERPA 1.4

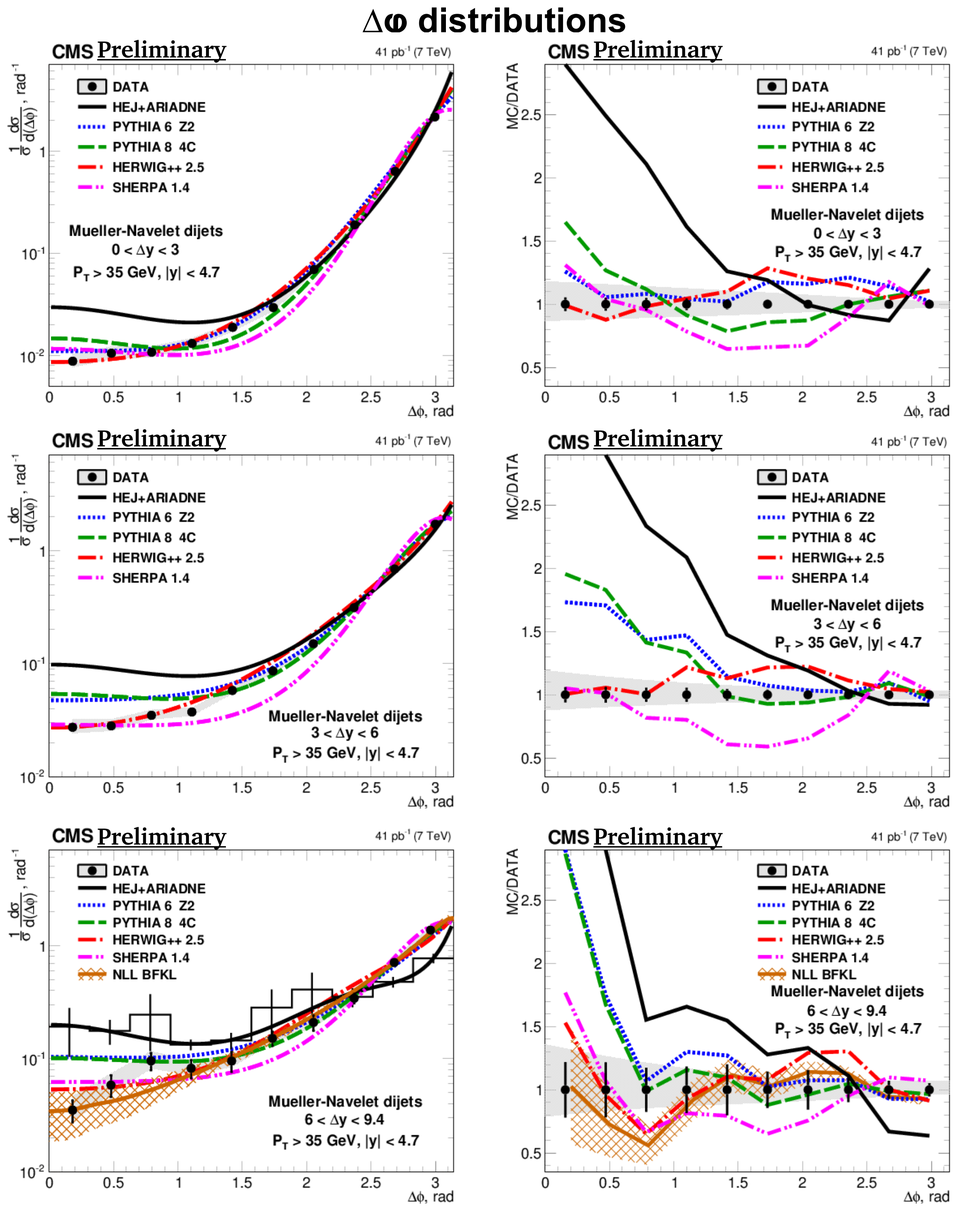
2) NLO MC genrator POWHEG interfaced with LL DGLAP-based PYTHIA 6 and PYTHIA 8

3) MC generator HEJ based on LL BFKL matrix elements and hadronisation provided by ARIADNE

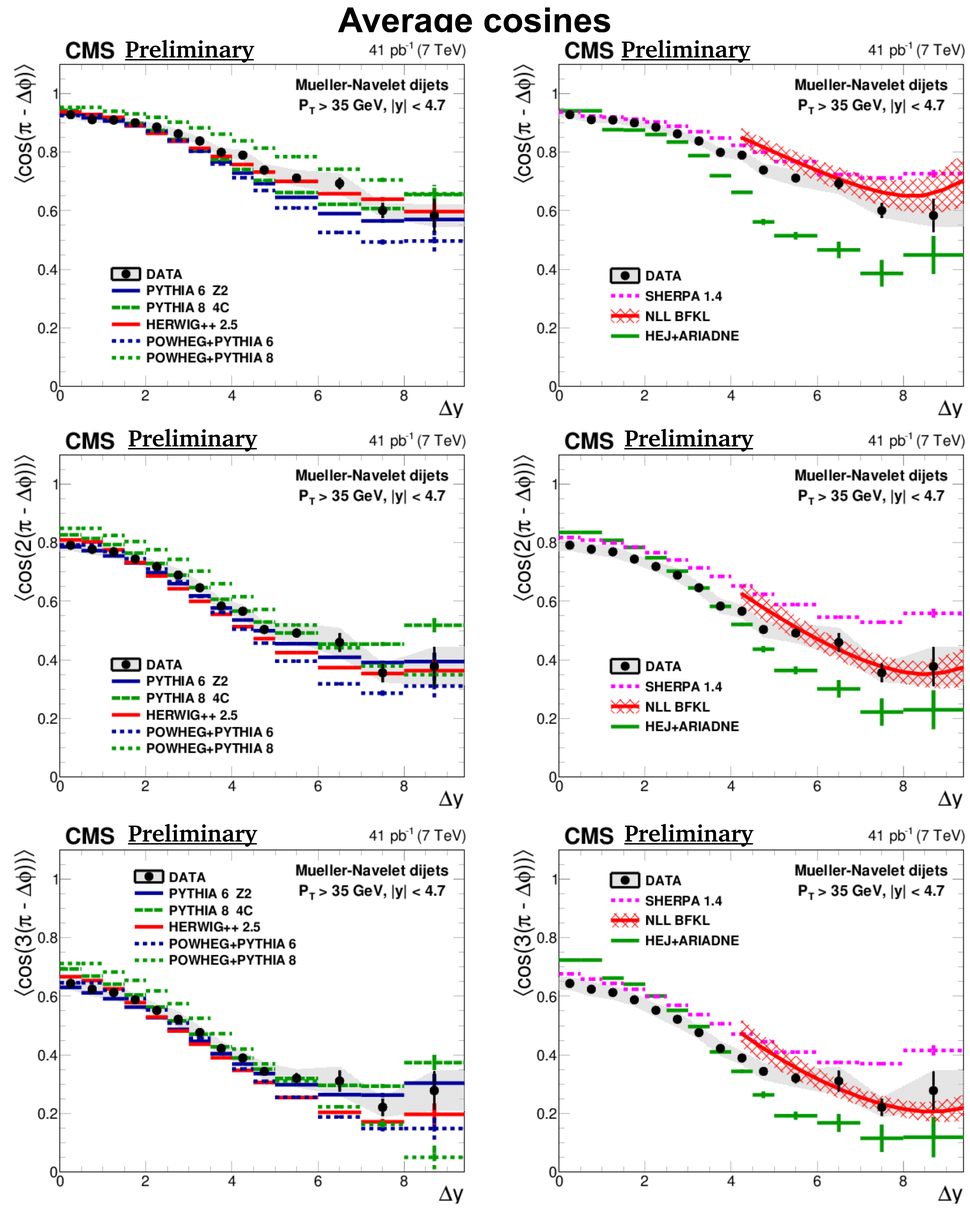
4) Analytical BFKL calculation performed at NLL approximation and improved by generalised optimal renormalisation scale

Results (preliminary) with NEW predictions (data points were published at CMS-PAS-FSQ-12-002, CMS Collaboration):

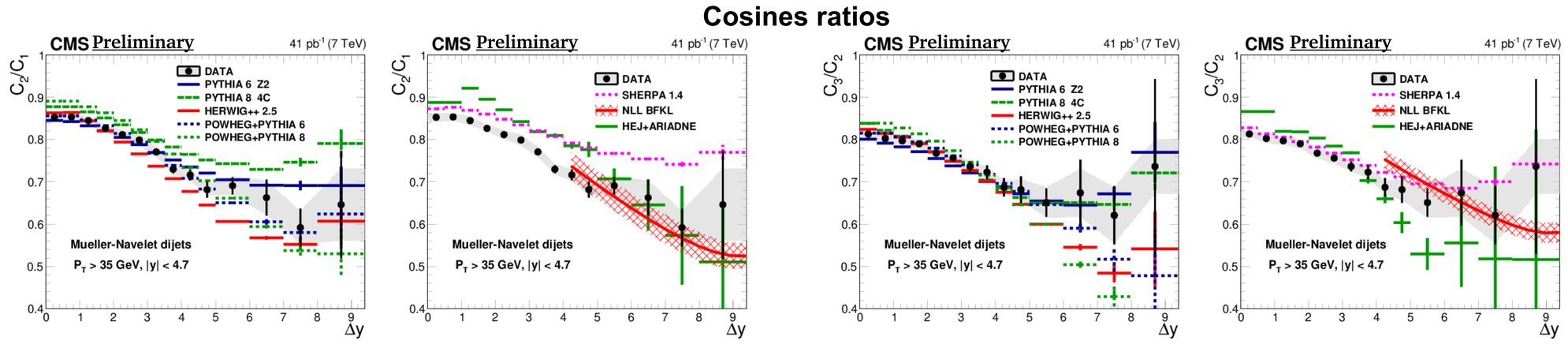
Δφ distributions



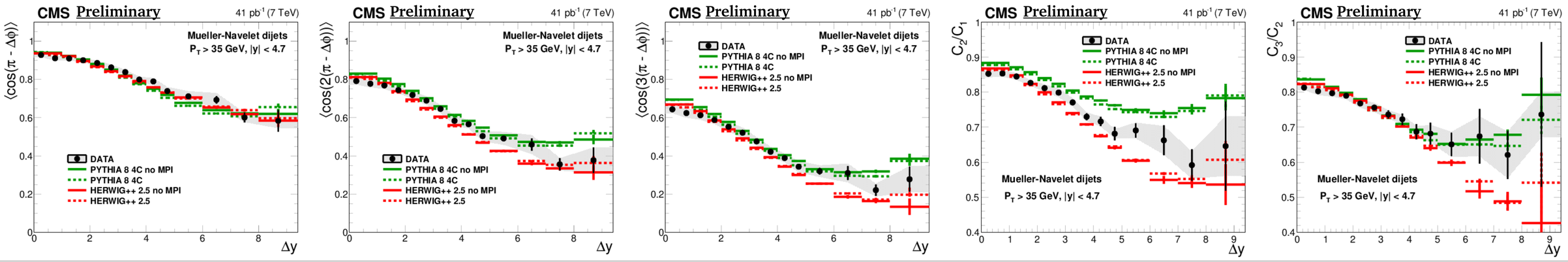
Average cosines



Cosines ratios



AO and MPI study



Conclusions:

✔*Azimuthal decorrelation of MN dijets as a function of rapidity separation is measured for the first time up to Δy = 9.4*

✔*Azimuthal decorrelation is sensitive to the details of QCD radiation implemented in different MC generators and their tunes*

✔***The observed sensitivity to the implementation of the colour-coherence effects in the DGLAP MC generators and a reasonable description by the NLL BFKL analytical calculations at large Δy may be considered as an indication that the kinematical domain of the present study lies in between the regions described by the DGLAP and BFKL approaches***