QCD & SM physics group @ CMS-DESY

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PhD students:

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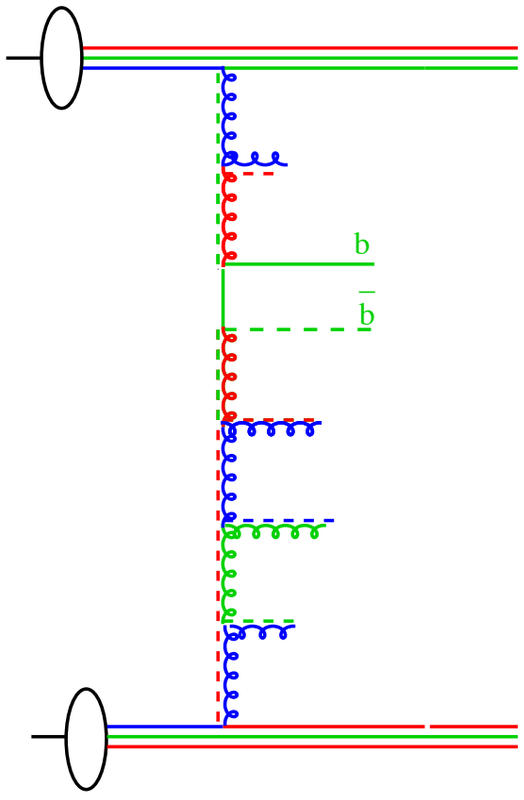
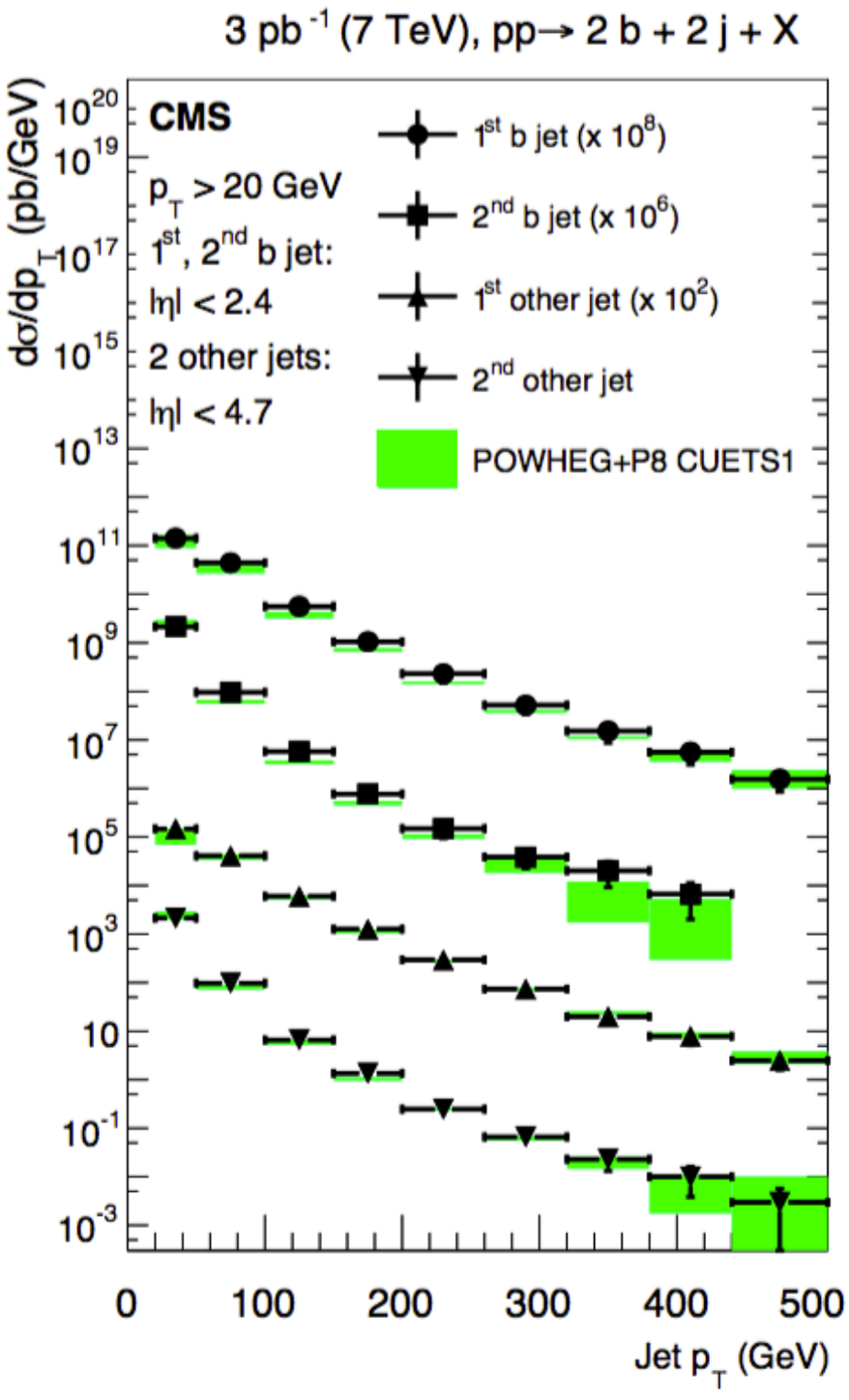
- Program:
  - inclusive jets at 13 TeV
  - W+c at 13 TeV
  - inclusive B-jet measurements
    - going to pre-approval in next month
  - dijet azimuthal correlations at highest pt
  - further detailed studies on soft physics:
    - going to pre-approval in next month, to be ready for MPI@LHC 2016

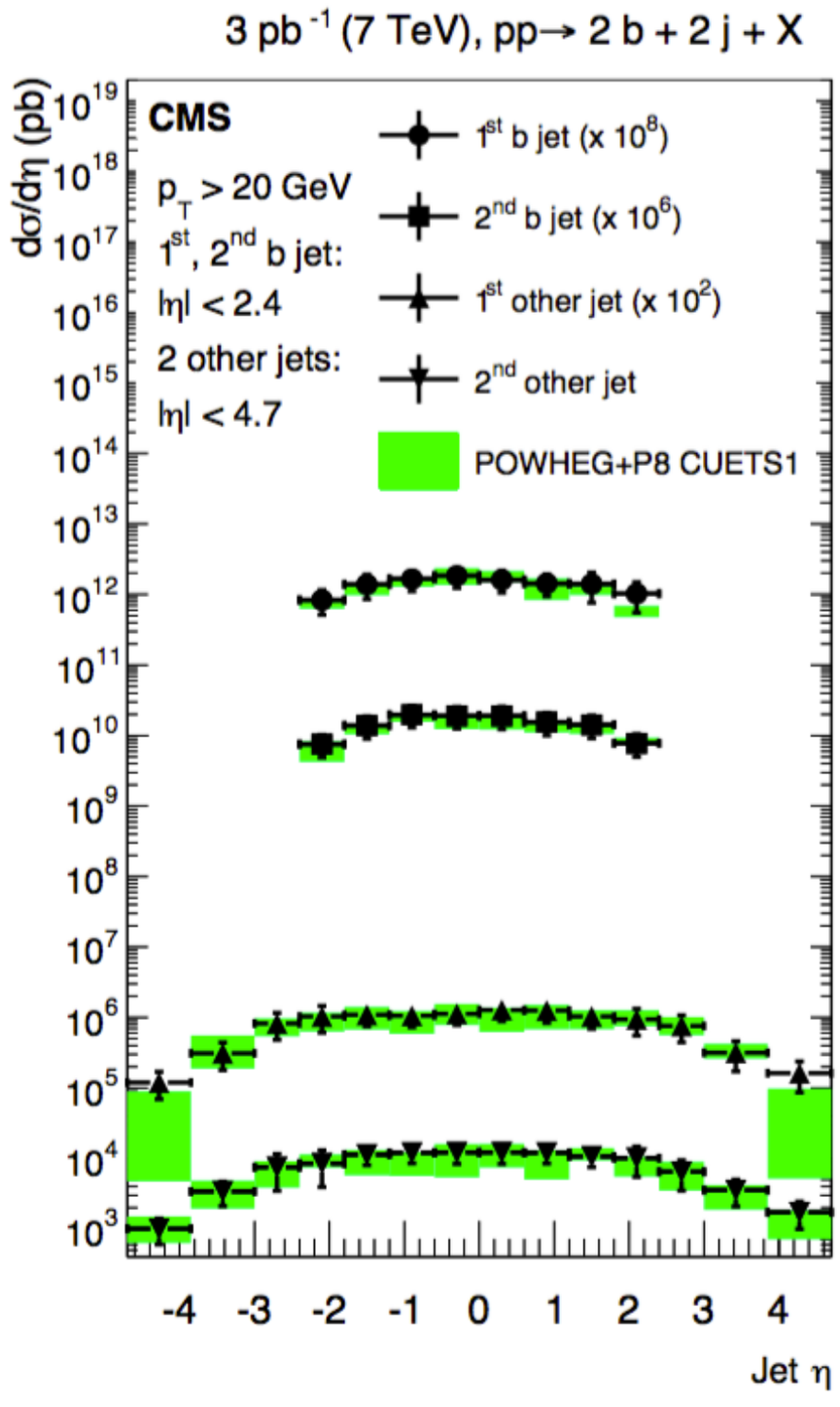
SMP measurements run1: 2b + 2 jets

- study correlations of b-jets and other jets



FSQ-13-010, arXiv 1609.03489

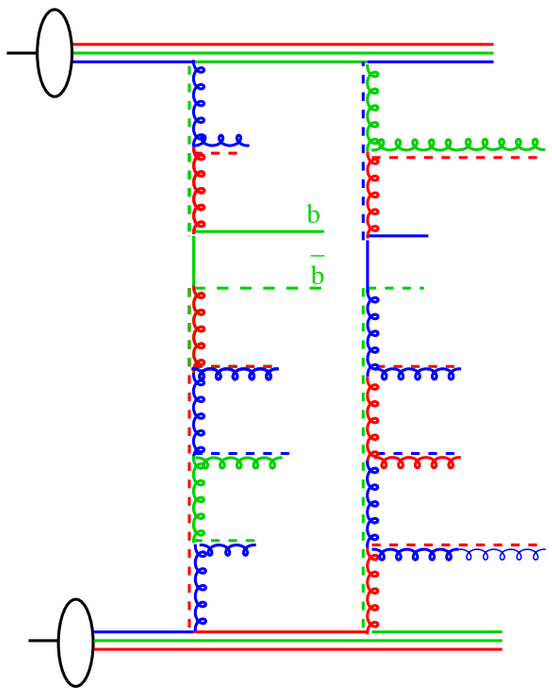


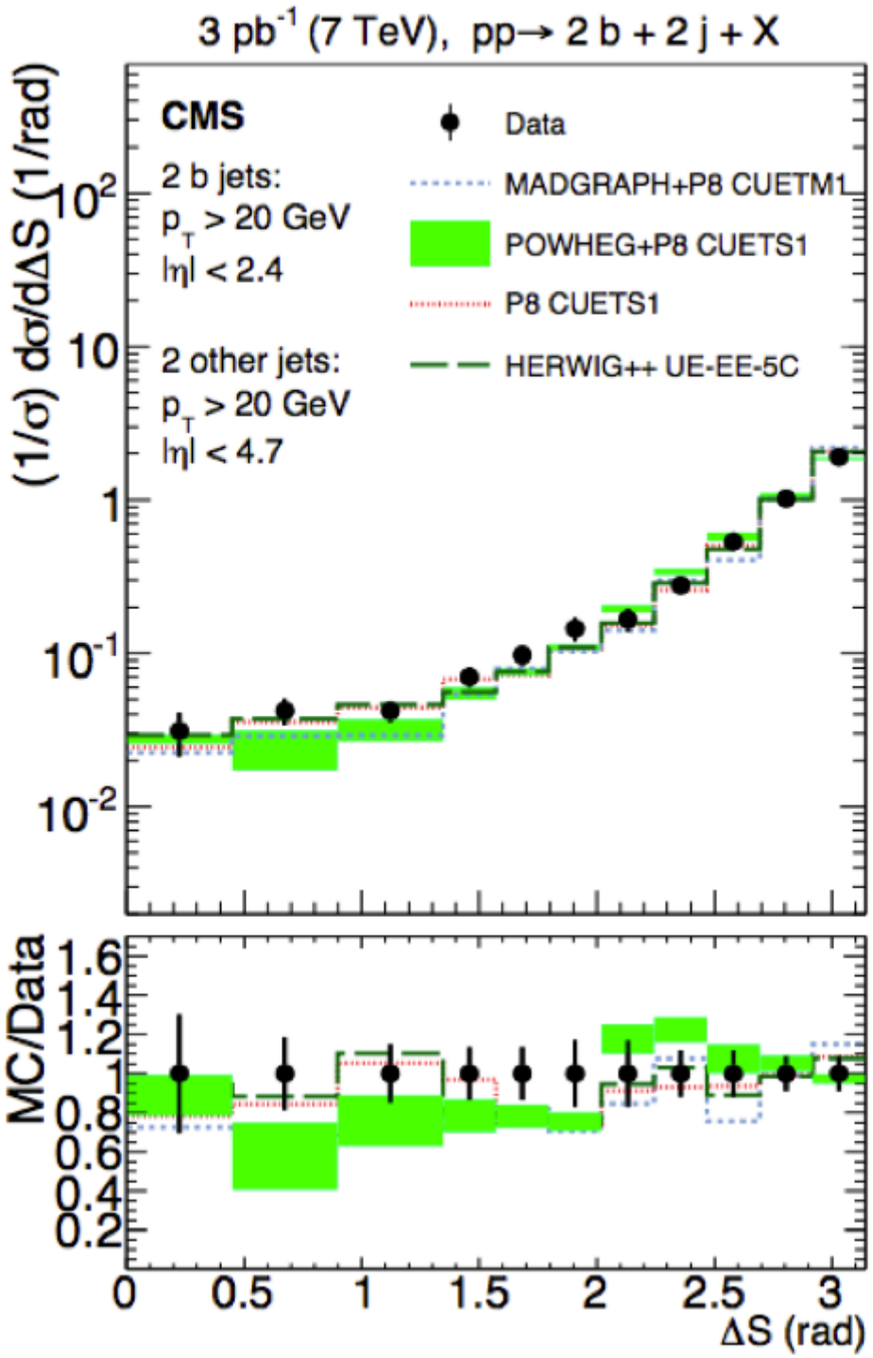


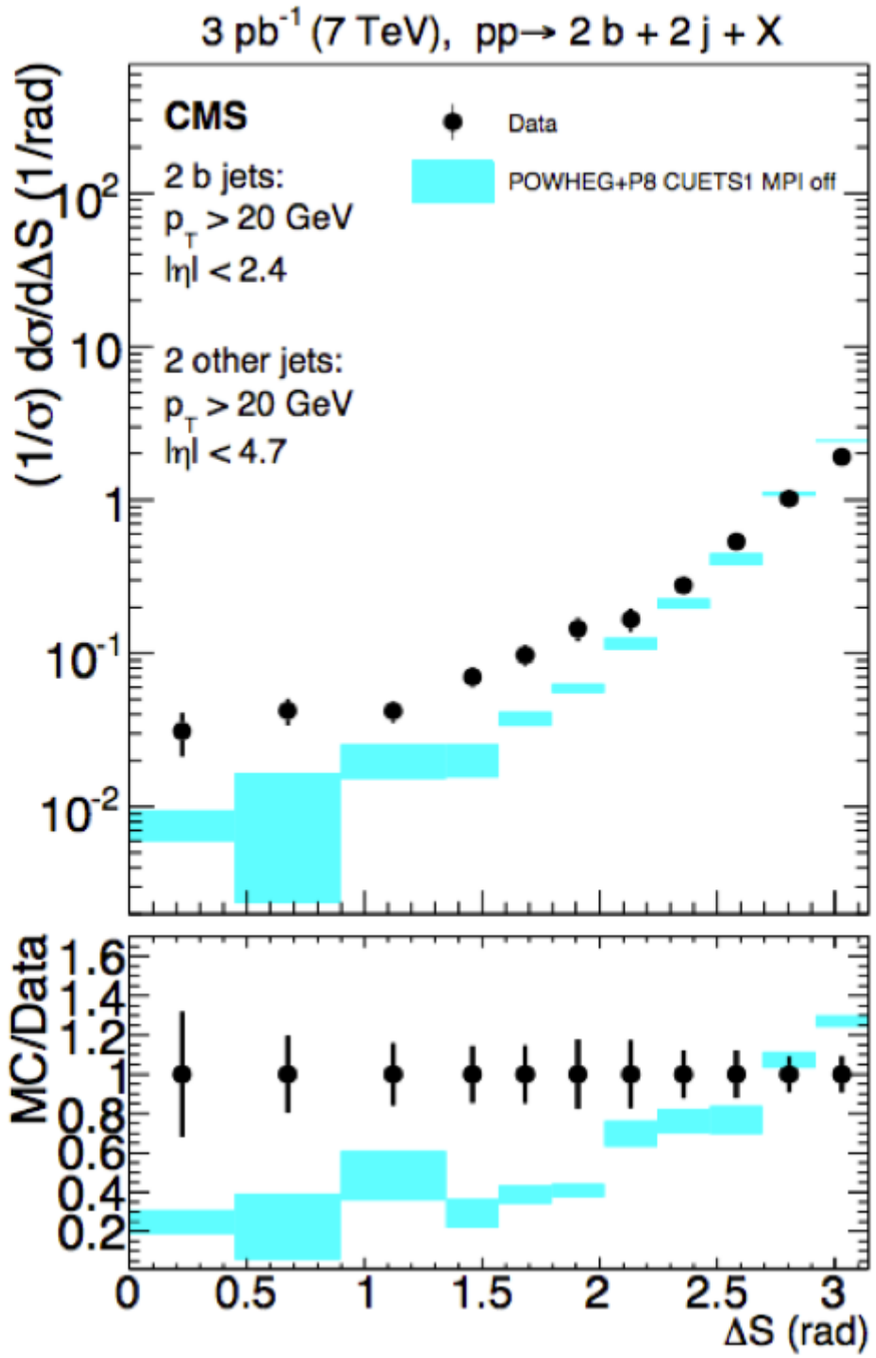
SMP measurements run1: 2b + 2 jets

- study correlations of b-jets and other jets
- sensitive to Double Parton Scattering

FSQ-13-010, arXiv 1609.03489

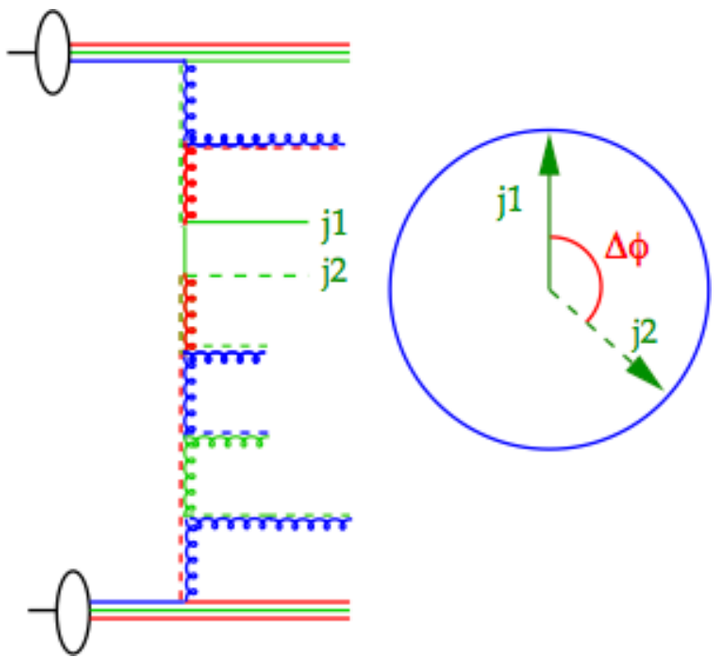




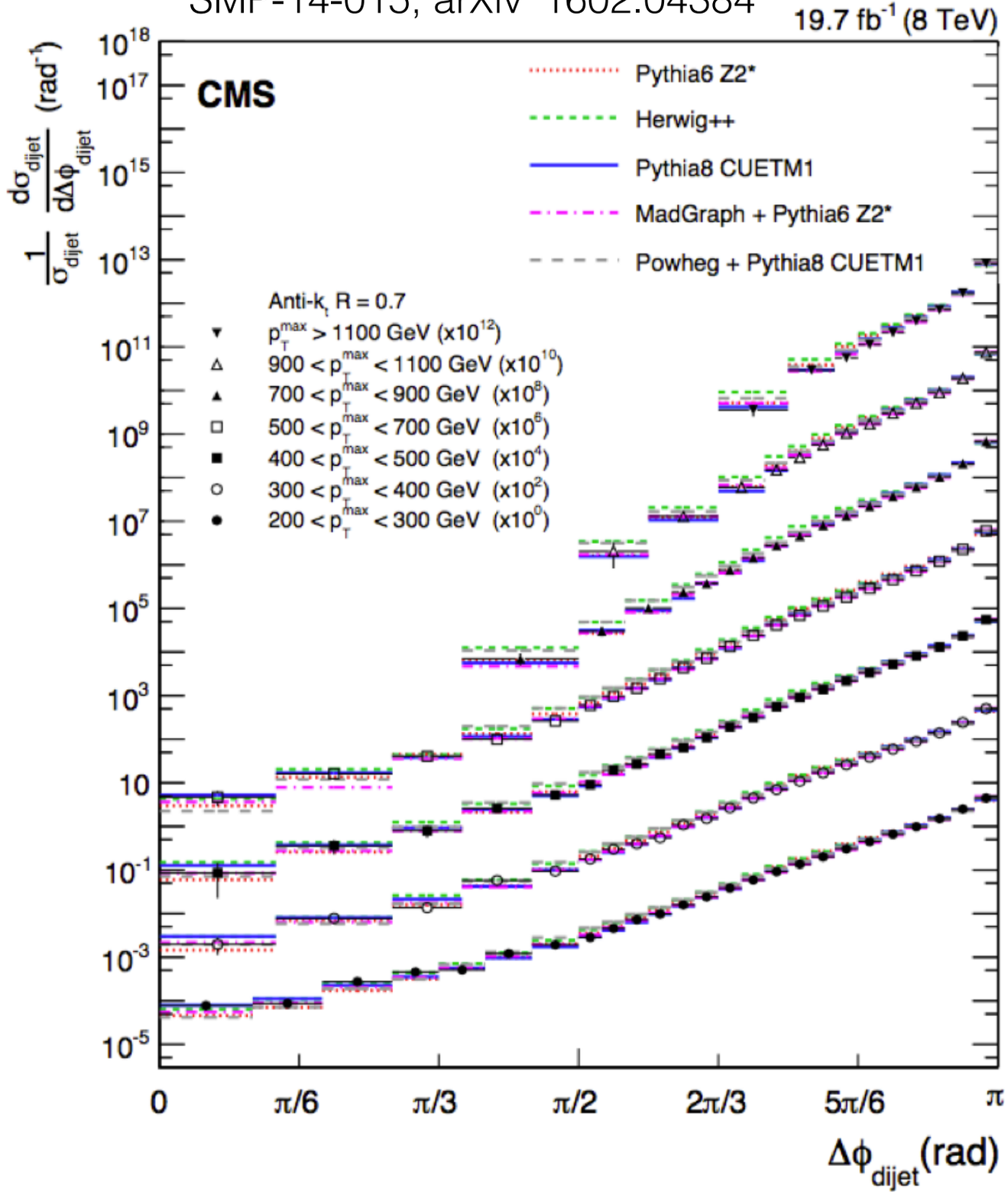


SMP measurements run1: azimuthal correlations

- Study azimuthal correlations in dijet events
  - sensitive to higher order contributions
- 8 TeV measurement released to EPJC
- DESY performs analysis at 13 TeV with full 2016 statistics



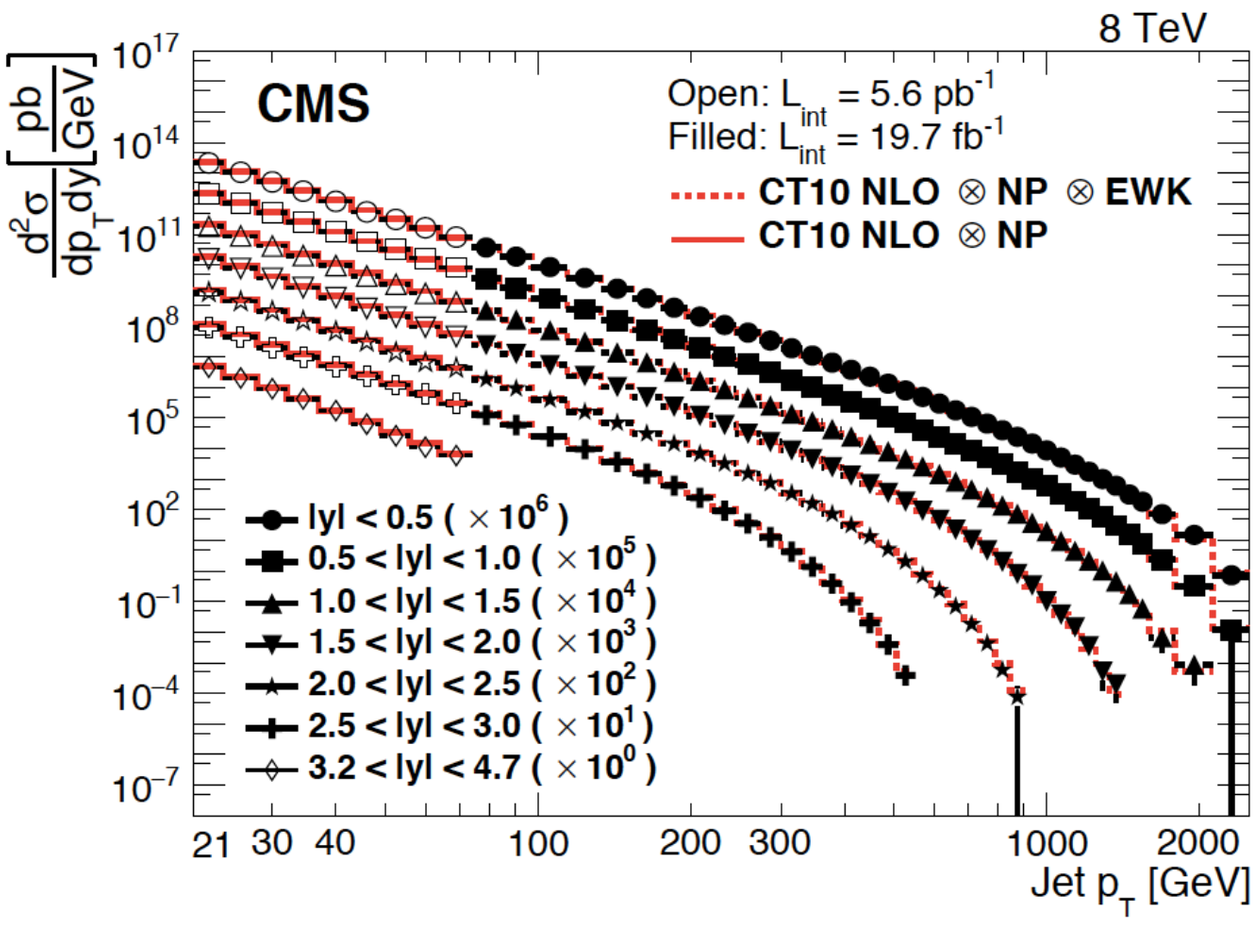
SMP-14-015, arXiv 1602.04384

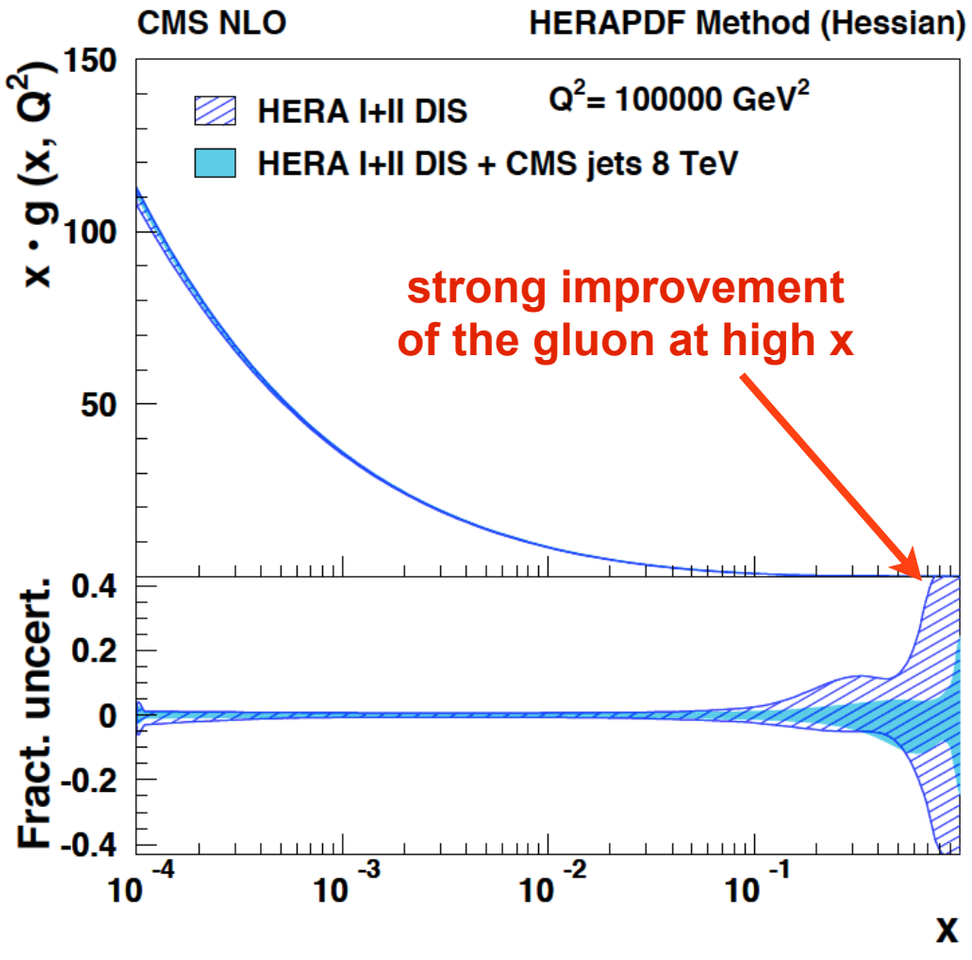


SMP measurements run1: QCD analysis

- Eur.Phys.J. C76 (2016) no.8, 469 Muon charge asymmetry in $W^{\pm}$ production at 8 TeV + PDF fit at NNLO (last PRC)

- arXiv:1609.05331 Measurement and QCD analysis of inclusive jet cross sections at 8 TeV, ratios to 2.76 and 7 TeV
  includes PDF fit at NLO and determination of $\alpha_S(M_Z)$ and $\alpha_S(Q)$ up to 1.5 TeV *(highest scale, reached)*



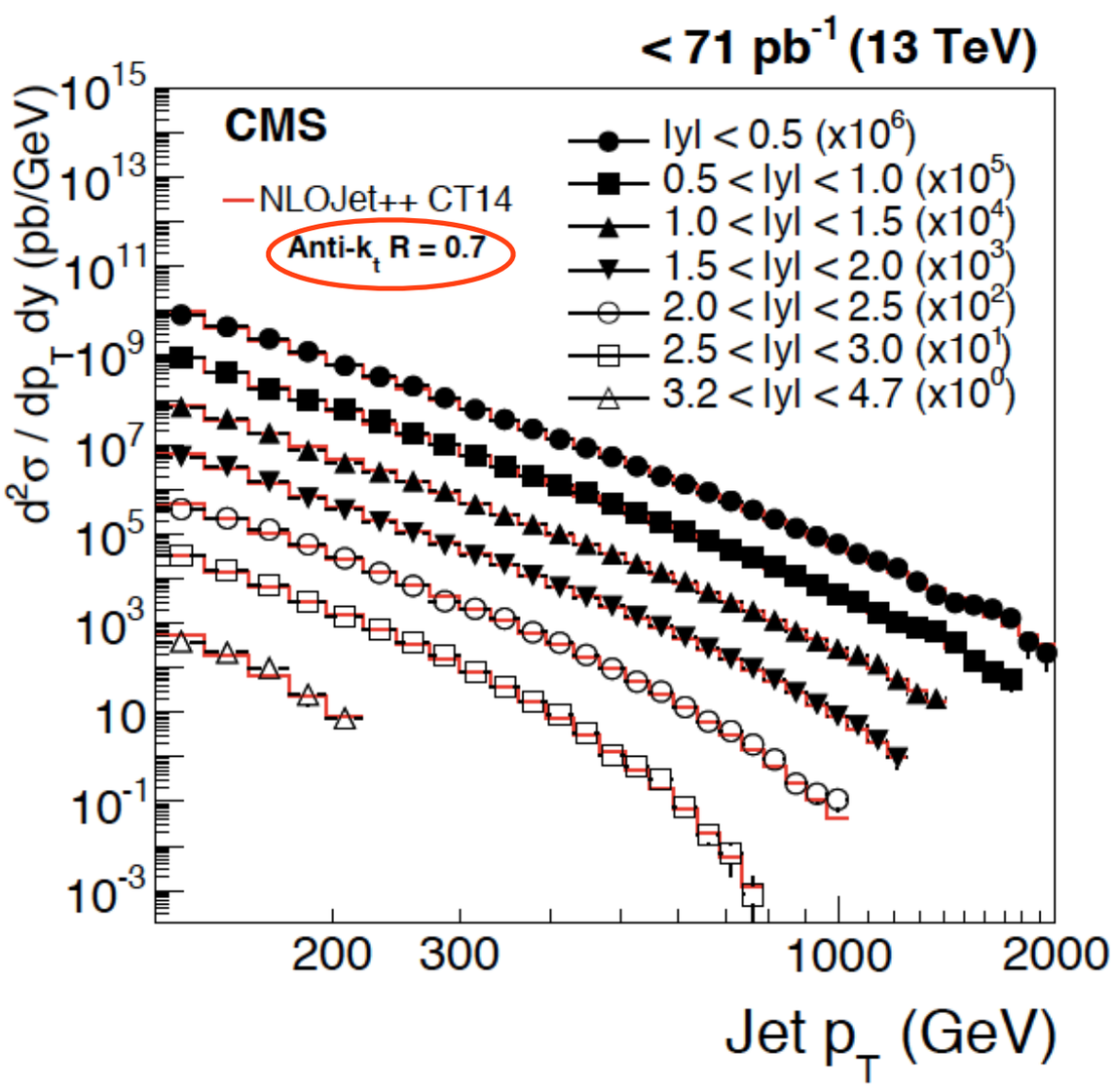


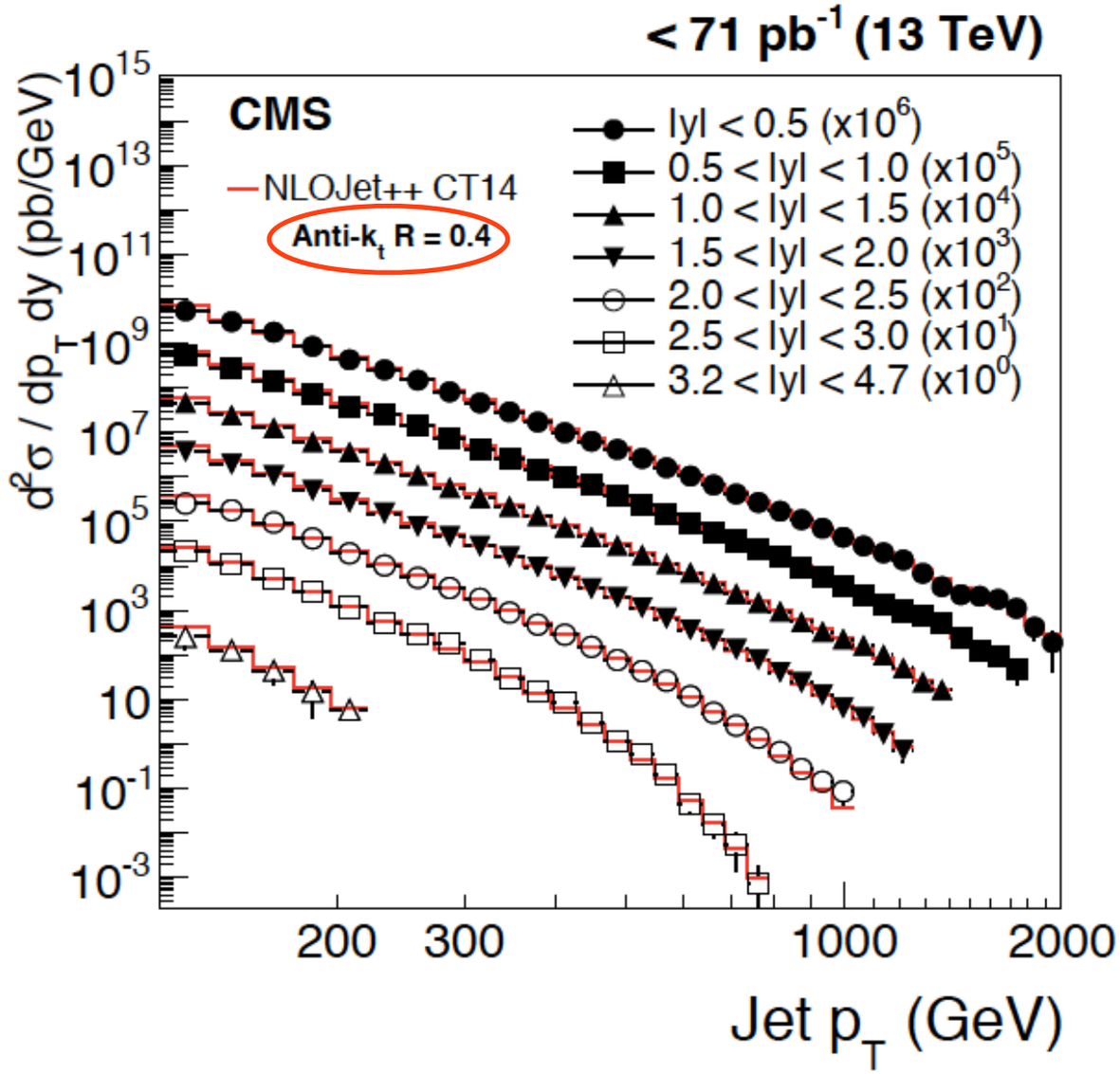
simultaneous determination of PDF and strong coupling at NLO : $\alpha_s(M_Z) = 0.1185^{+0.0019}_{-0.0026}(\mathrm{fit})^{+0.0022}_{-0.0018}(\mathrm{scale})$

very good agreement with world average

SMP measurements run2: inclusive jets at 13 TeV

First measurement published in Eur. Phys.J. C76 (2016) no.8, 469





Full luminosity measurement ongoing, DESY leads the analysis