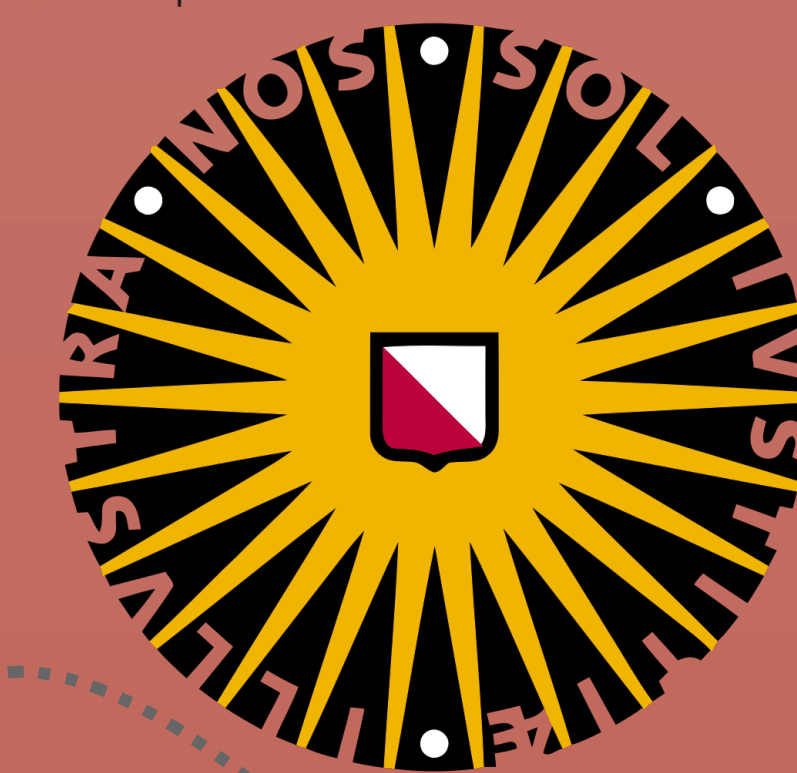




ALICE

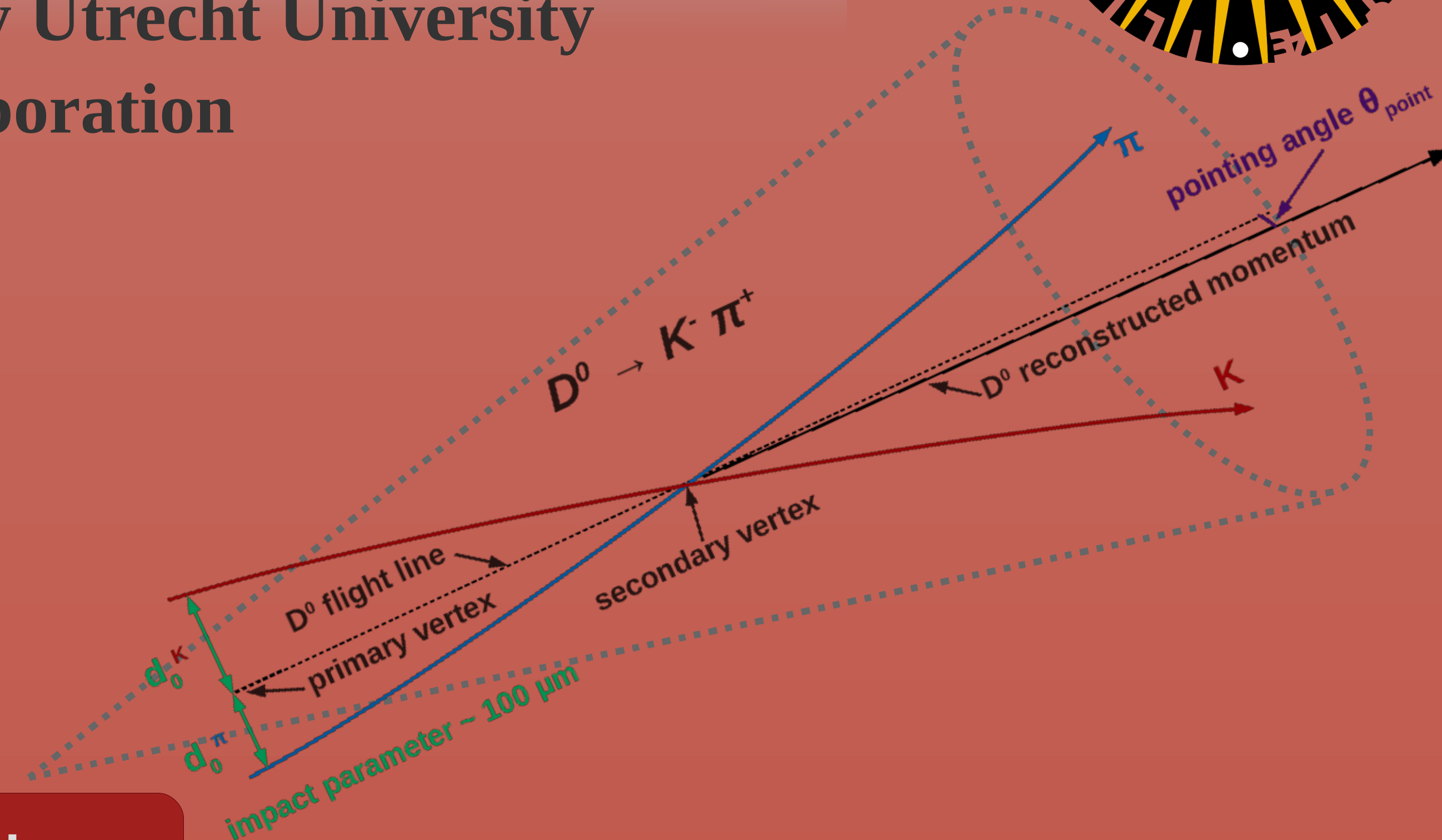
D-tagged jet production and fragmentation measurements in pp collisions with ALICE

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Motivation

- D mesons: sensitive probes of perturbative QCD, down to low p_T
- D-tagged jets:
 - Further constrains on heavy-quark production mechanism and its fragmentation
 - Constrains on gluon fragmentation function [1]

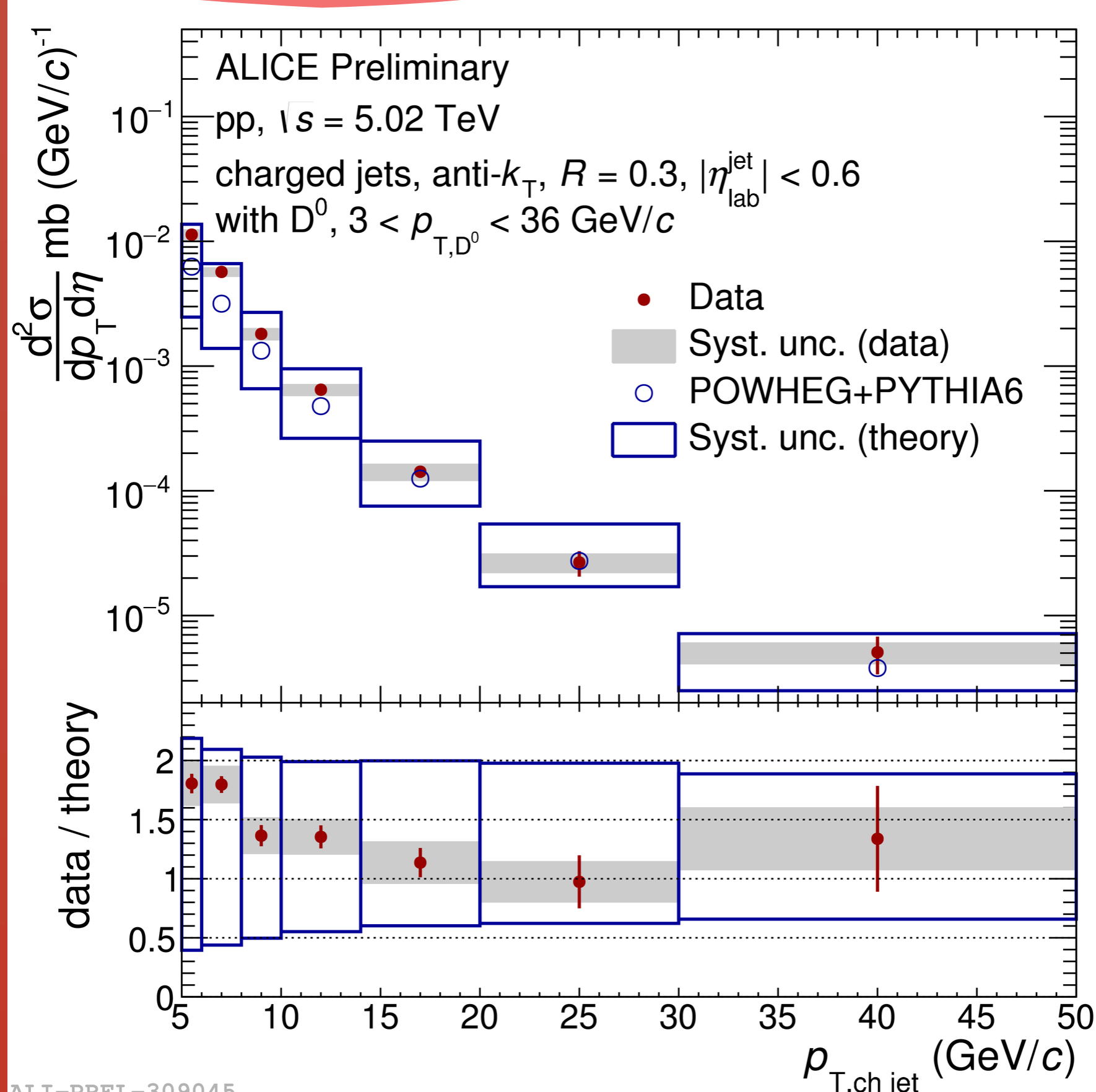


Method

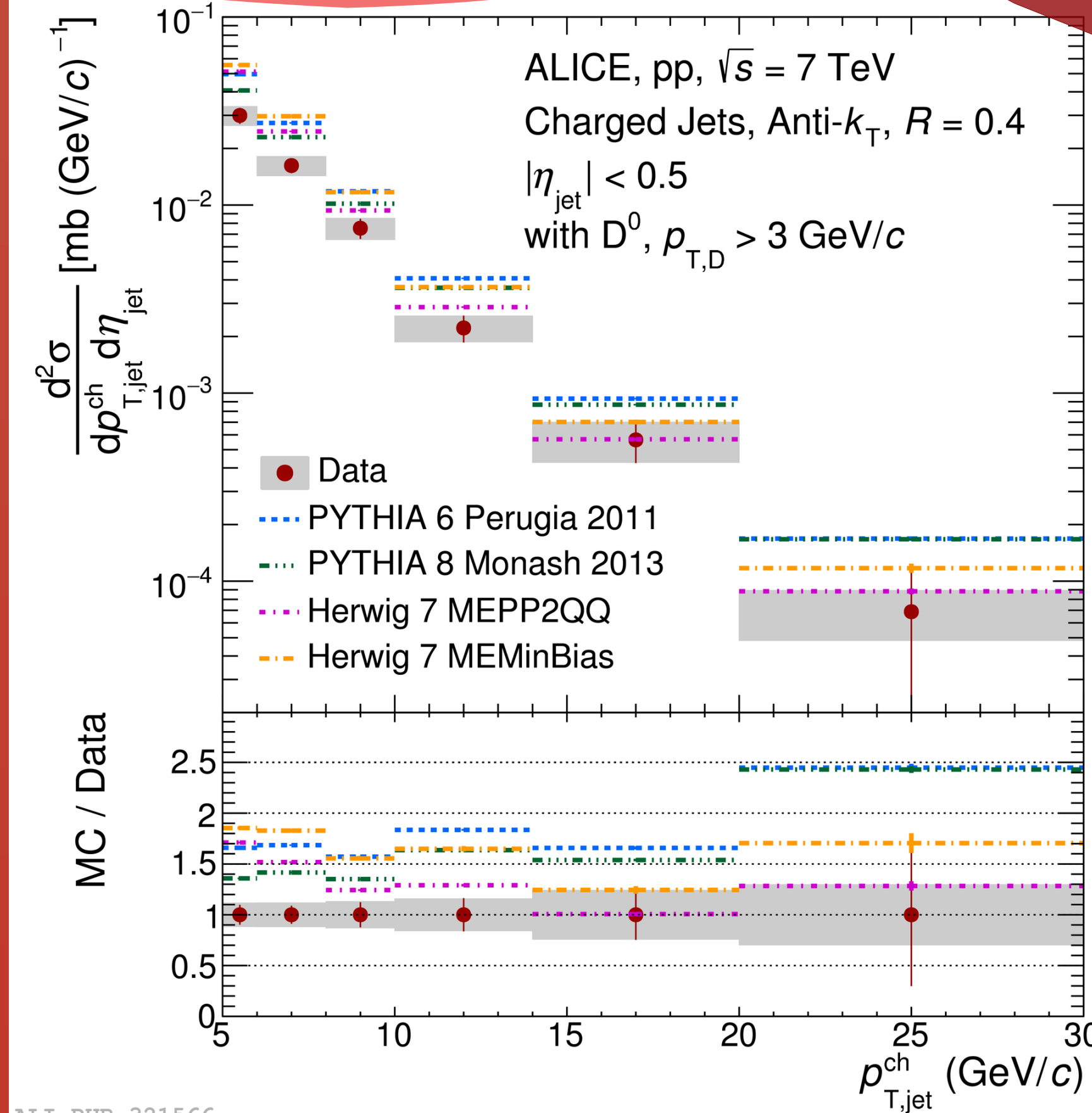
- D mesons: full reconstruction of hadronic decays $D^0 \rightarrow K^- \pi^+$ (BR=3.89 +/- 0.04% [2])
- Replace D-meson daughter particles with the D meson
- Jet reconstruction with FastJet anti- k_T algorithm: charged-particle tracks, $R=0.3, 0.4$
- Tagging: D meson as the jet constituent
- Invariant mass analysis
- Correction for the D-jet efficiency
- Subtraction of the B feed-down component: POWHEG-based method
- Unfolding for the detector effects

p_T -differential cross-section

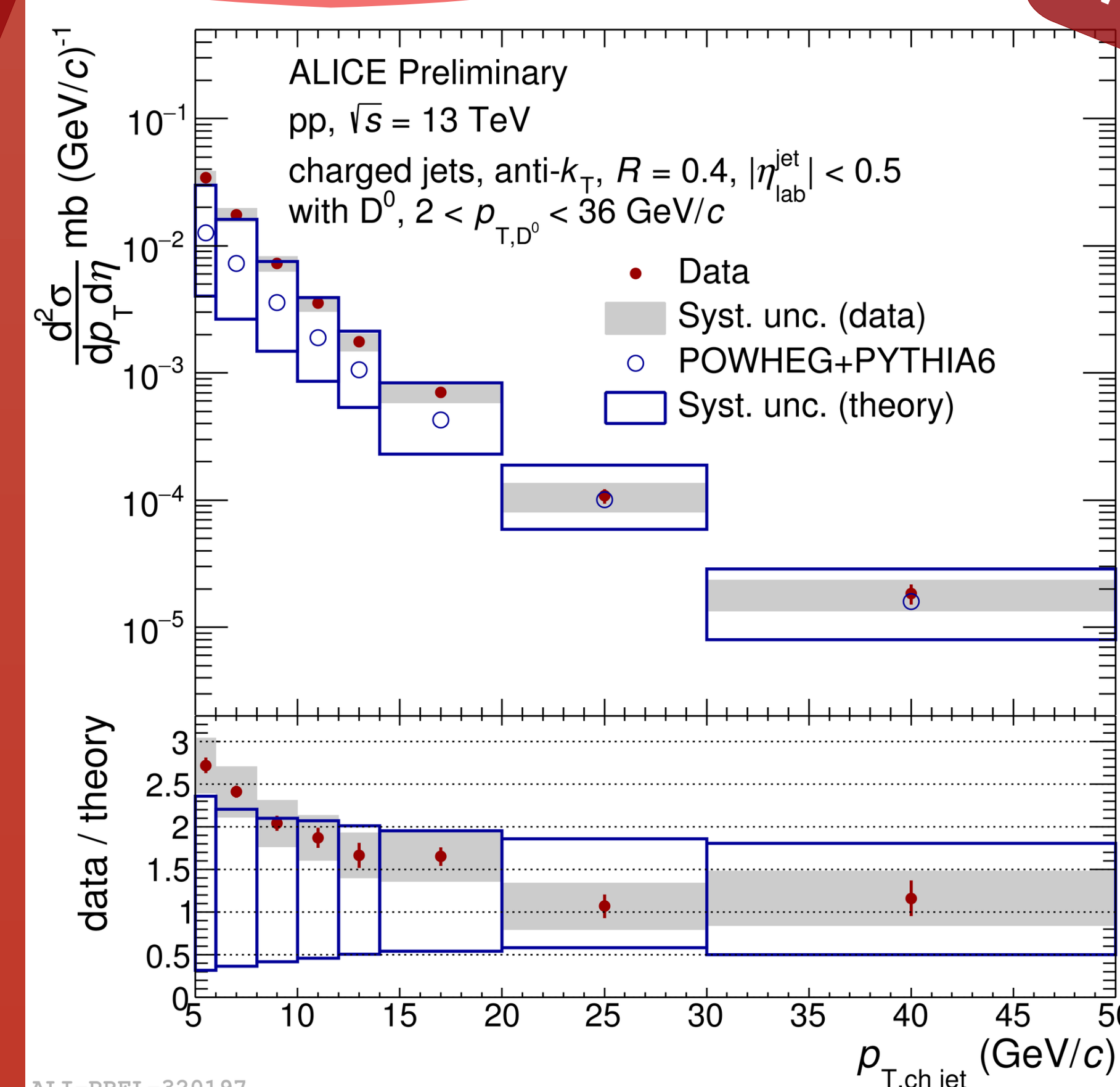
$\sqrt{s} = 5.02$ TeV
 $R = 0.3, p_{T,D} > 3$ GeV/c



$\sqrt{s} = 7$ TeV
 $R = 0.4, p_{T,D} > 3$ GeV/c



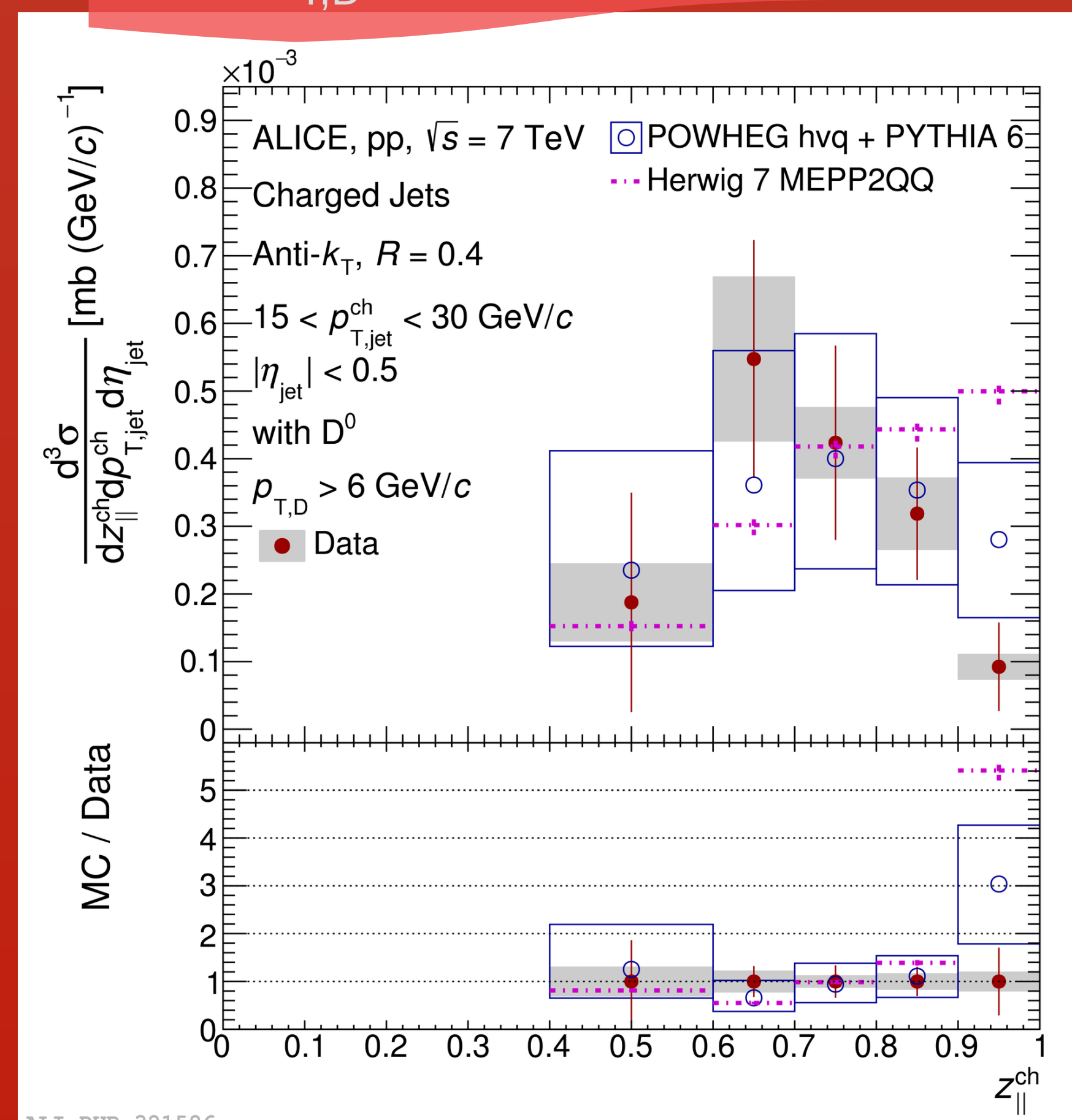
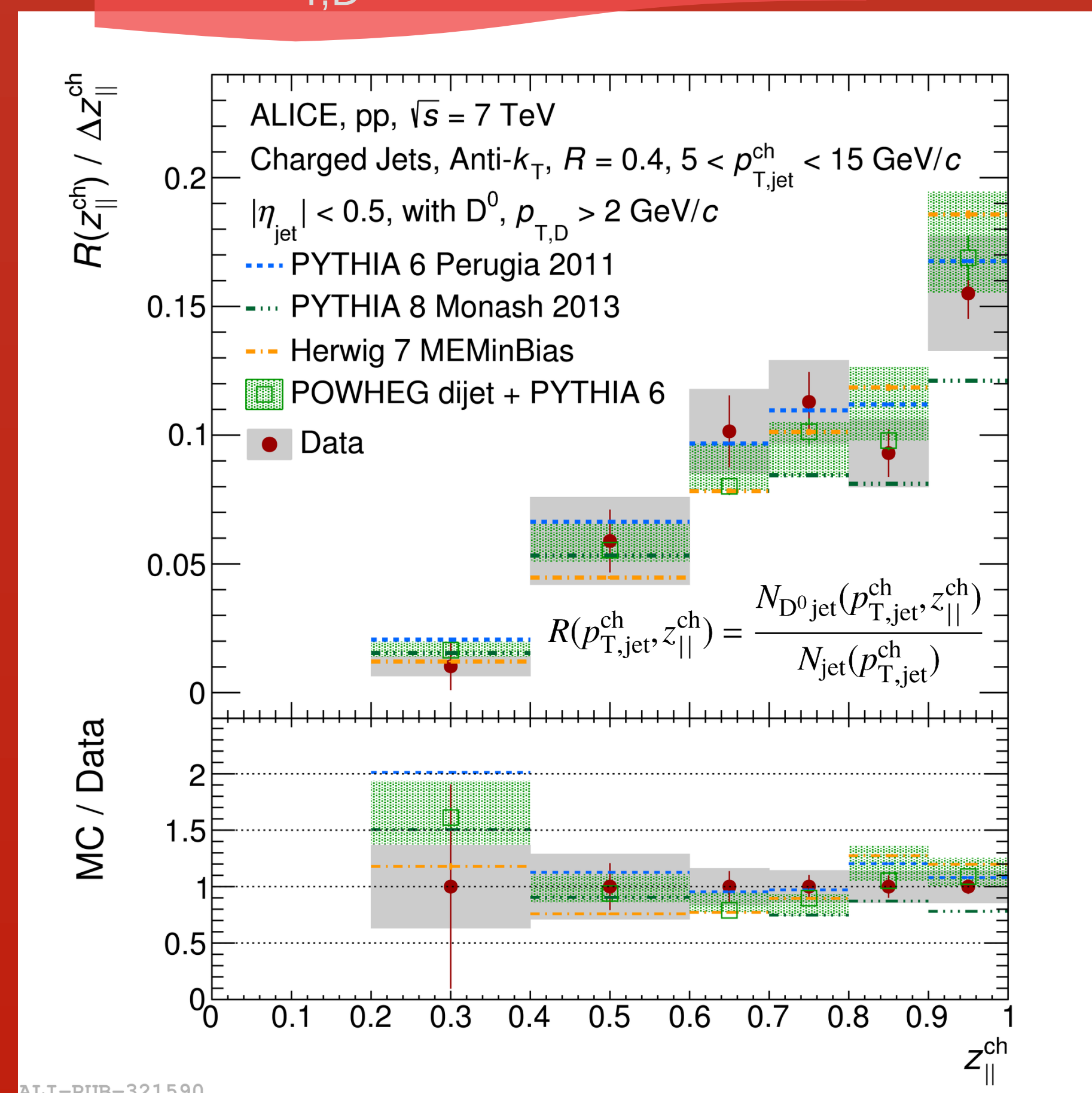
$\sqrt{s} = 13$ TeV
 $R = 0.4, p_{T,D} > 2$ GeV/c



Momentum fraction distribution z at $\sqrt{s} = 7$ TeV [3]

$5 < p_{T,jet} < 15$ GeV/c
 $p_{T,D} > 2$ GeV/c

$15 < p_{T,jet} < 30$ GeV/c
 $p_{T,D} > 6$ GeV/c



Jet momentum fraction carried by the D^0 meson in the direction of jet axis:

$$z_{||} = \frac{\vec{p}_{chjet} \cdot \vec{p}_D}{\vec{p}_{chjet} \cdot \vec{p}_{chjet}}$$

Conclusions

- **Cross-section:** (i) agreement with NLO pQCD predictions from POWHEG+PYTHIA6 (hvq) (ii) overestimated by PYTHIA6,8 and HERWIG 7
- **Momentum fraction:** (i) agreement with models (ii) hint of softer fragmentation in data at higher jet p_T

Outlook

- More precise momentum fraction measurements with pp data at $\sqrt{s} = 5.02, 13$ TeV coming soon

References:

- [1] D.P.Anderle *et al.*, PRD 96, (2017) 034028
- [2] PDG, PRD 98 no. 3, (2018) 030001
- [3] ALICE, arXiv: 1905.02510

