

Sherpa: Status of soft physics and UE

Hendrik Hoeth
(Durham University)



Overview

Status – where we are today

Present – minbias and UE in 1.2.3

Future – sneak preview

Release schedule

Sherpa 1.2.3 is the current stable version. Mainly a bugfix release, tuned to preliminary LHC data, available since December.

Sherpa 1.3.0 is the next major version and will contain changes in the physics, e. g. an improved soft physics model (minbias) and improved hadronisation. We plan to release 1.3.0 during the first half of this year.

Today I show 1.2.3 and a glimpse on the current development version leading to 1.3.0, comparing to the recently published ATLAS data. For Tevatron look at my MPI@LHC Glasgow talk.

Tuning status

We have tuned Sherpa 1.2.3 to hadron data from Tevatron and LHC, using Rivet and Professor.

Tuning results have been published together with the release.

There are tunes for two different PDFs, and we will probably make a third, as we believe it is important for PDF uncertainty estimates to have a tuned MC:

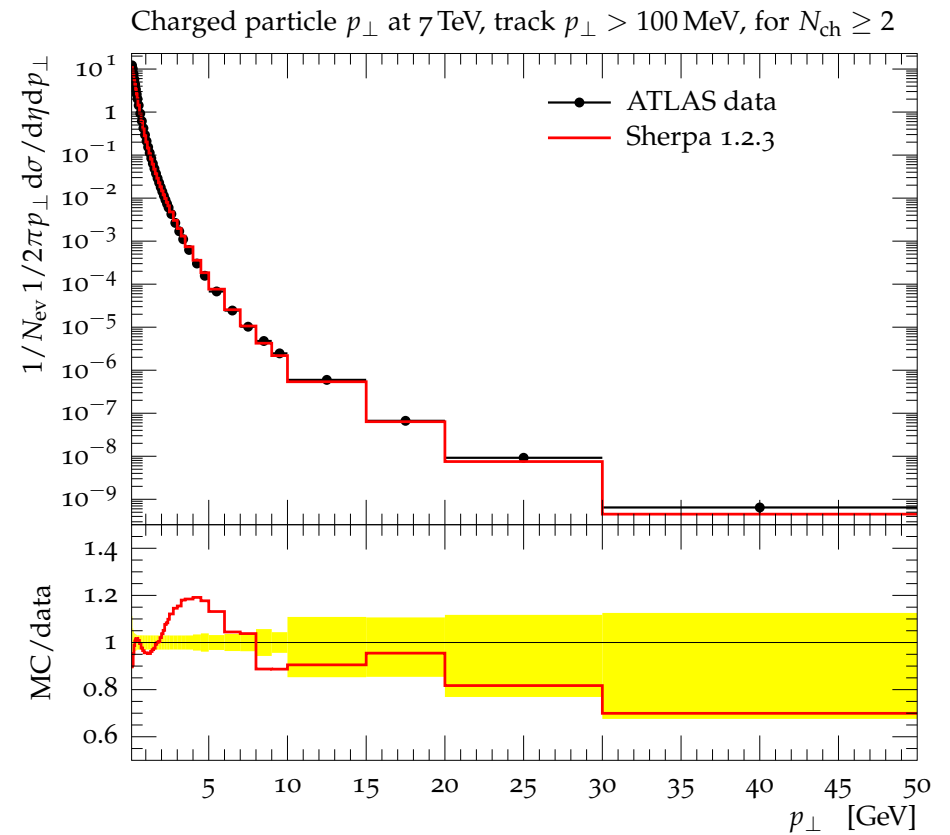
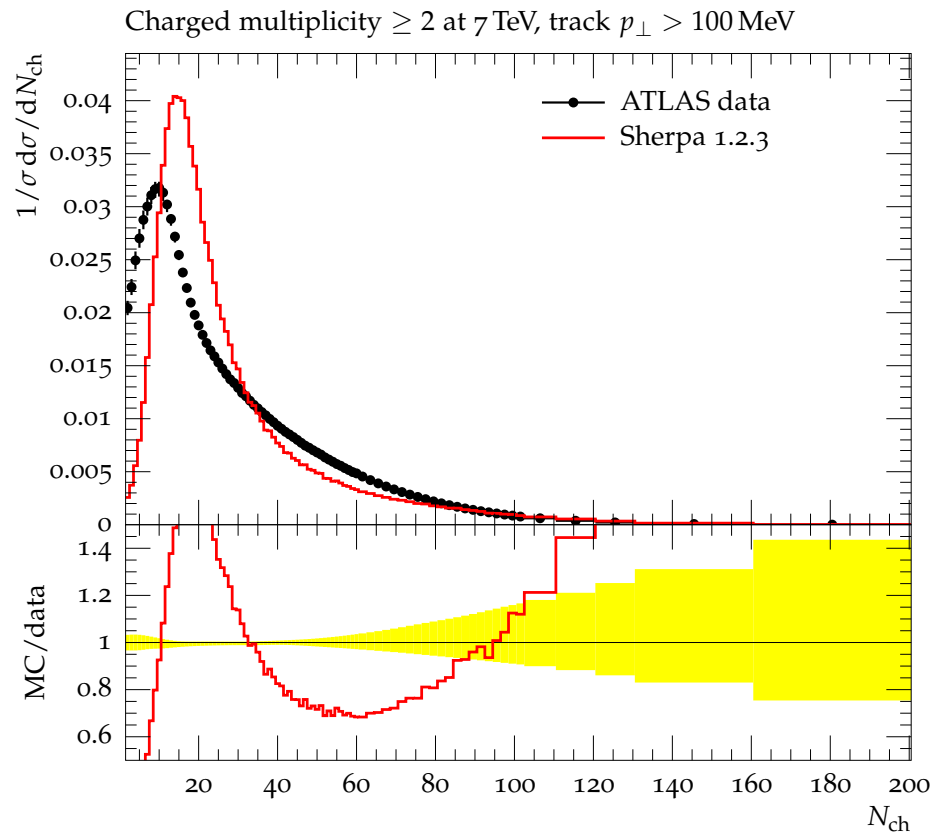
CTEQ66 – default in 1.2.3

CTEQ6L1 – available in 1.2.3

LO*(*) – planned, probably for next minor release, maybe before

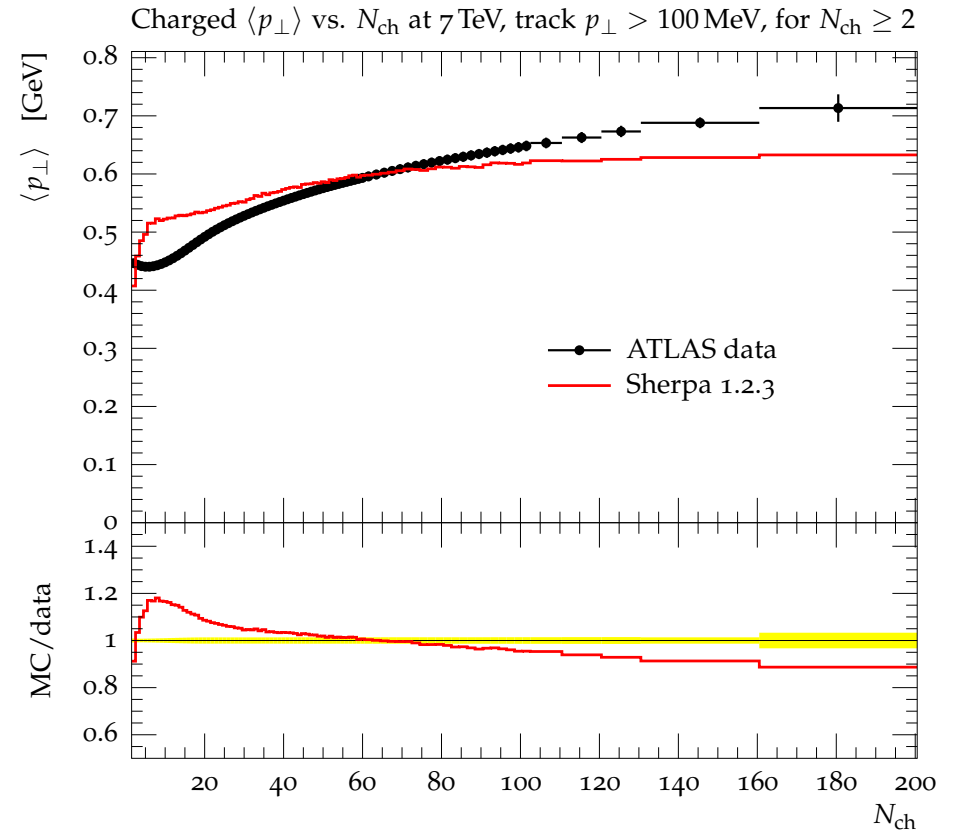
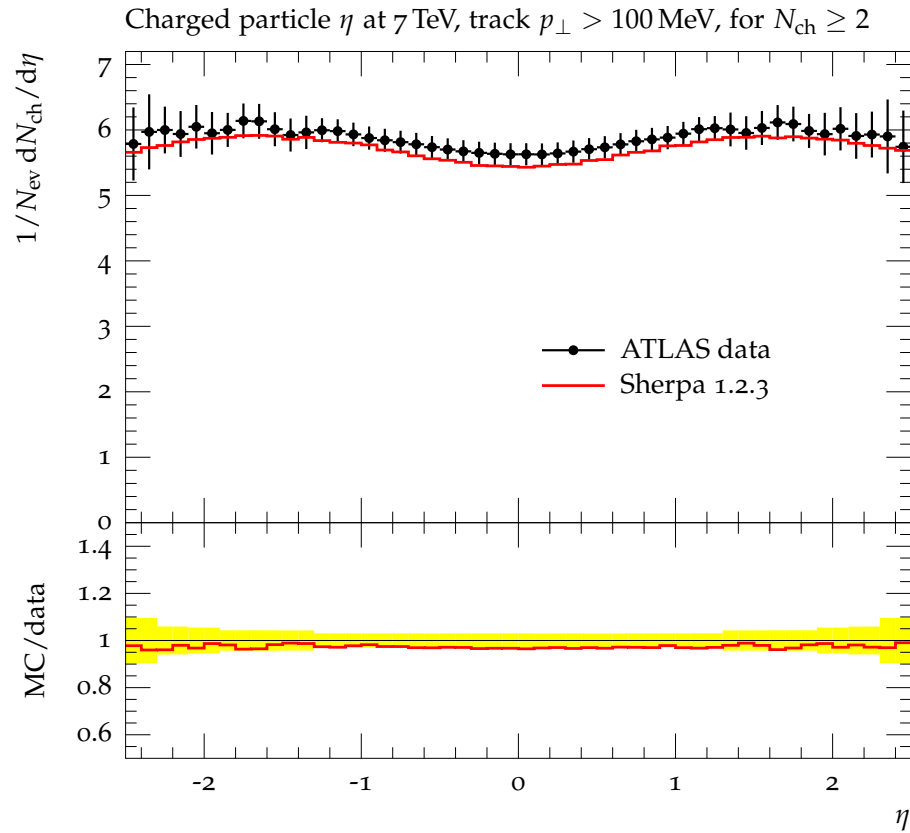
Minimum Bias at 7 TeV

arXiv:1012.5104



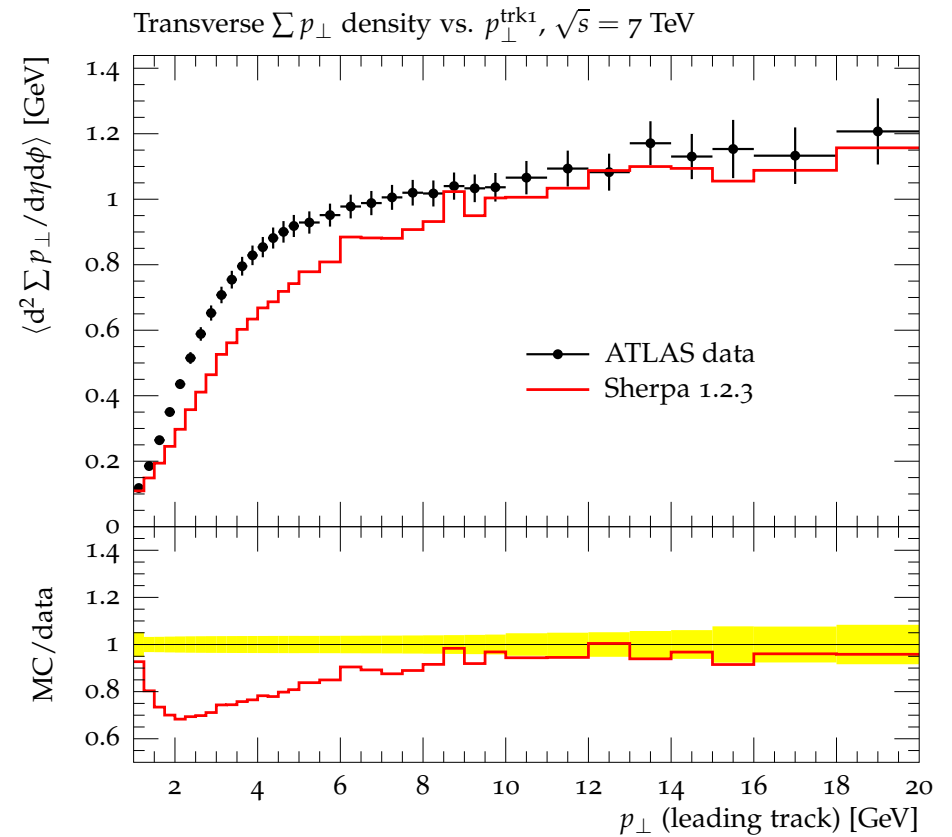
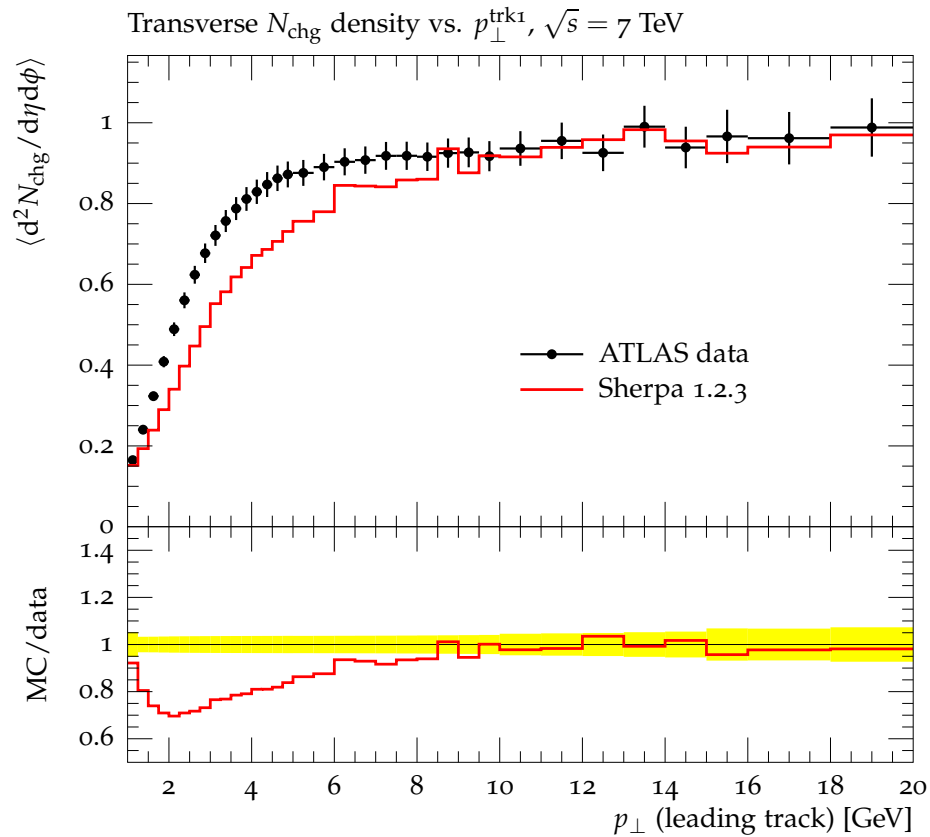
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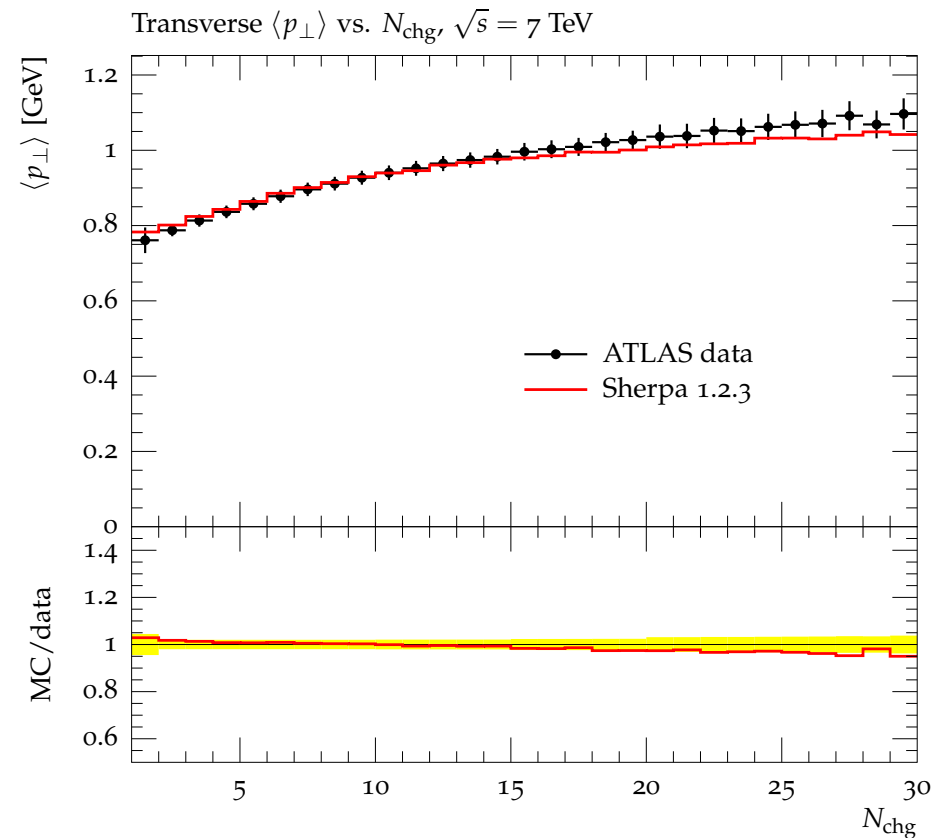
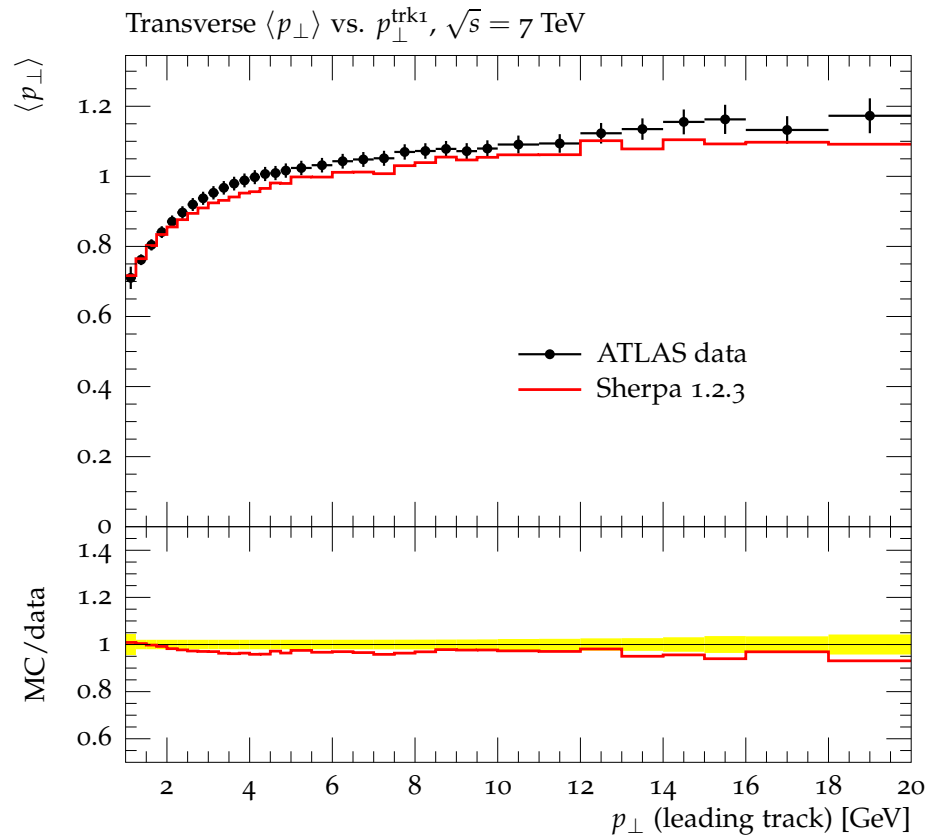
Underlying Event at 7 TeV

arXiv:1012.0791



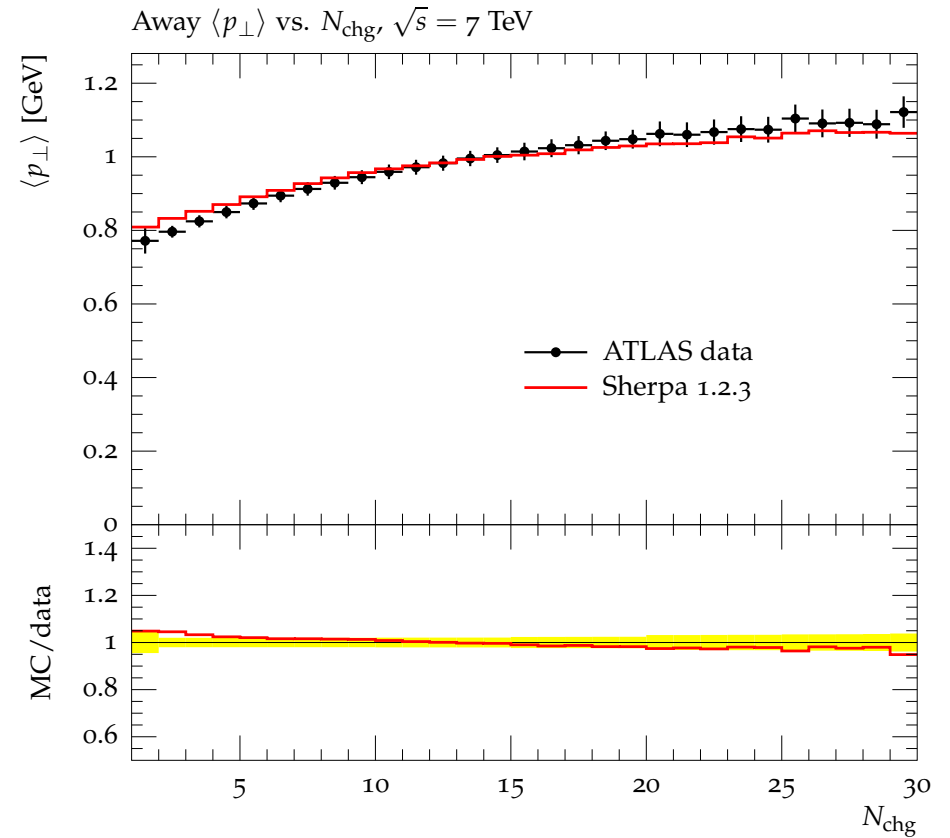
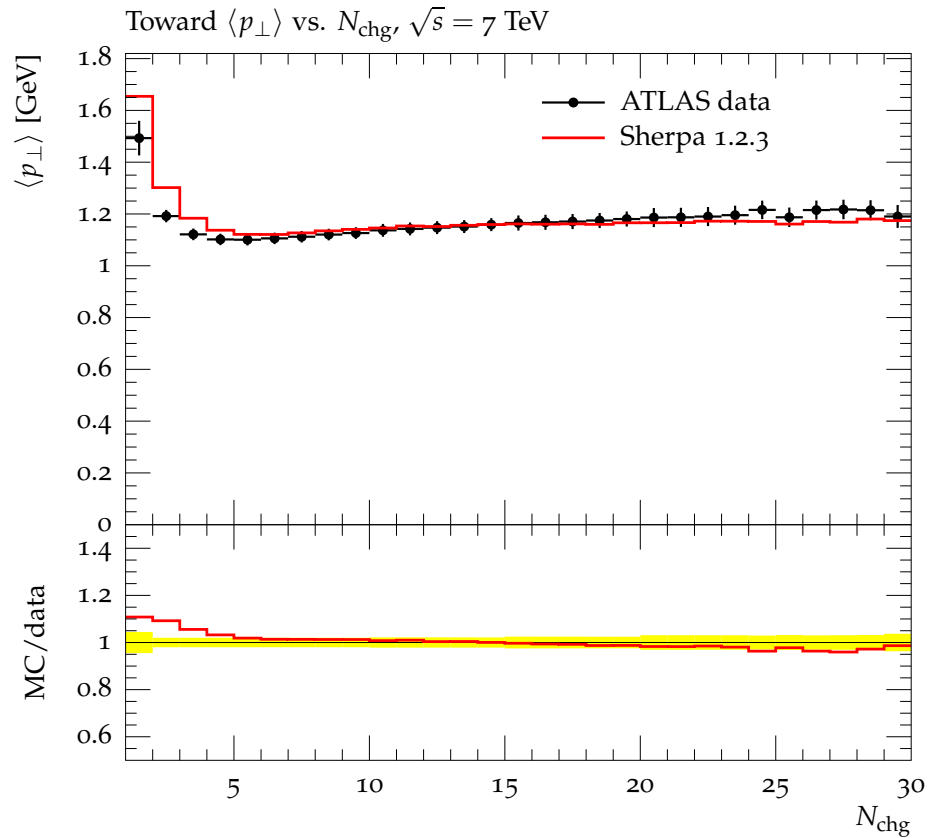
Underlying Event at 7 TeV

arXiv:1012.0791



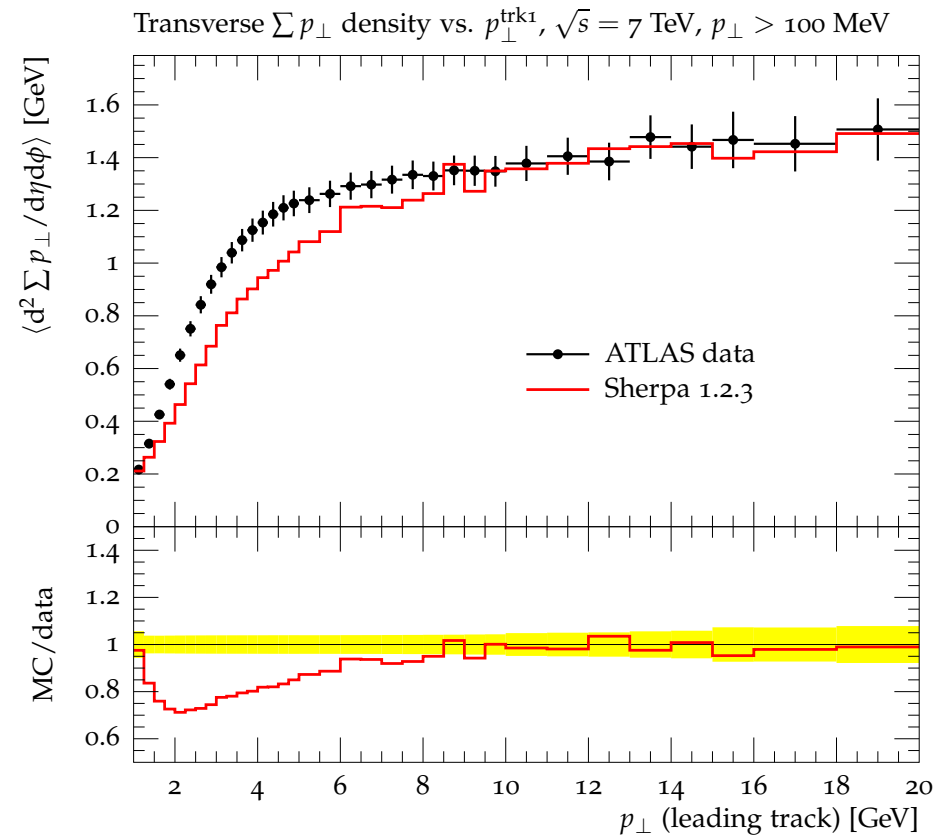
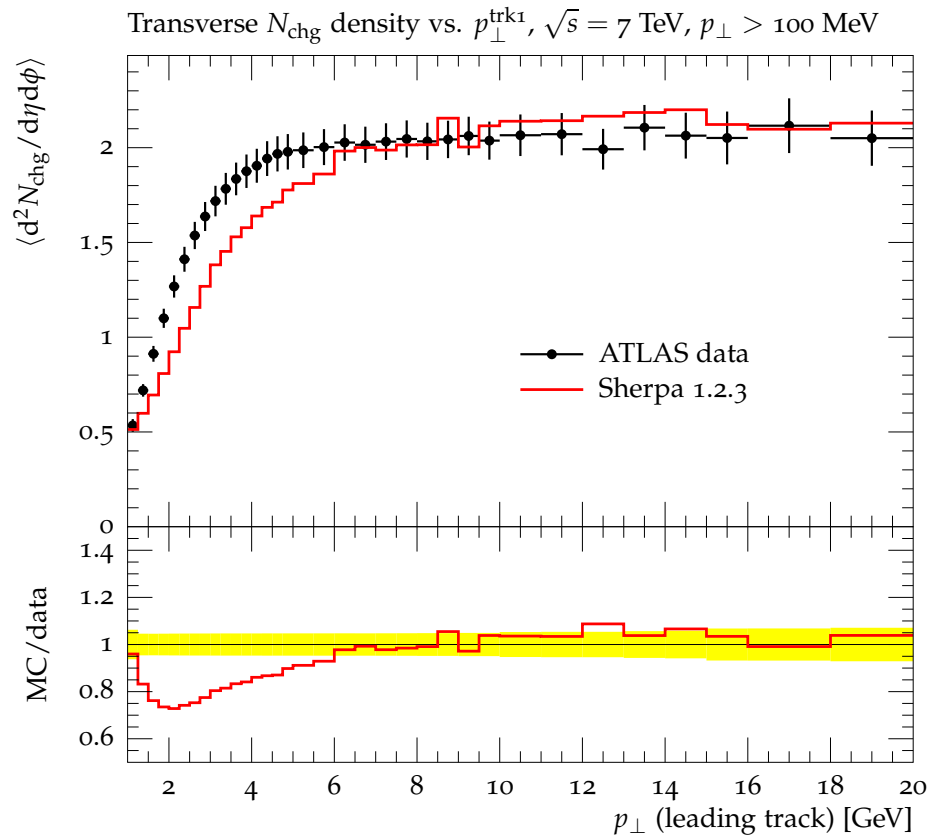
Underlying Event at 7 TeV

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Underlying Event at 7 TeV

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Sneak Preview on Upcoming Soft Physics in Sherpa

Based on KMR model (Khoze, Martin, Ryskin): Gluon ladder exchange between incoming partons.

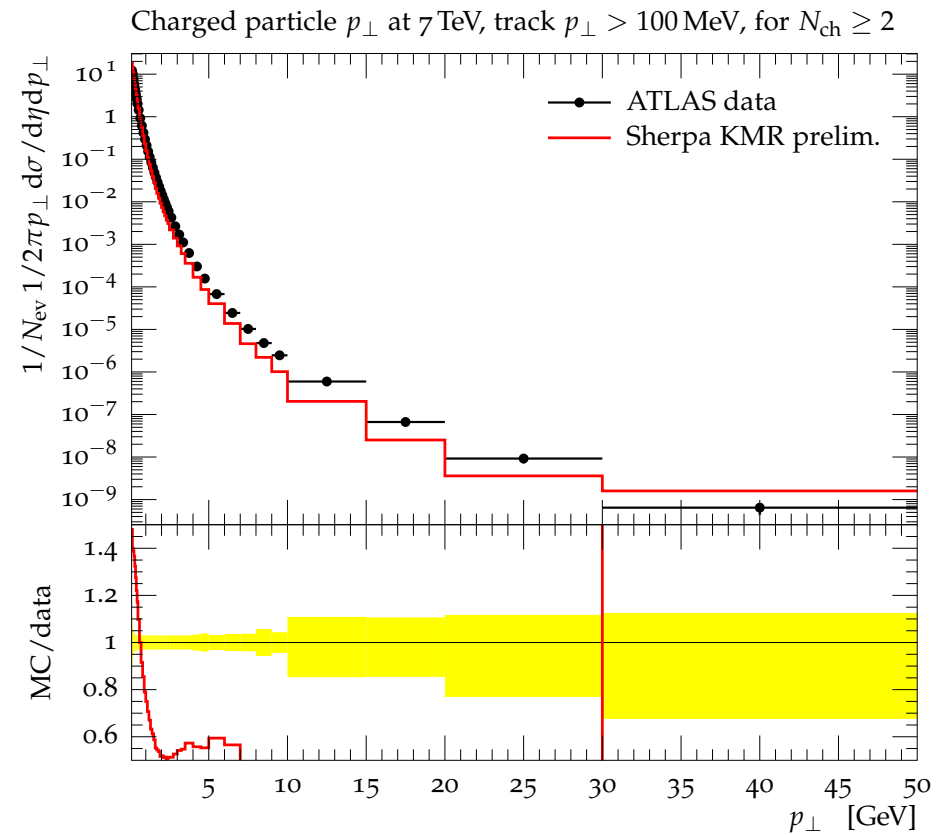
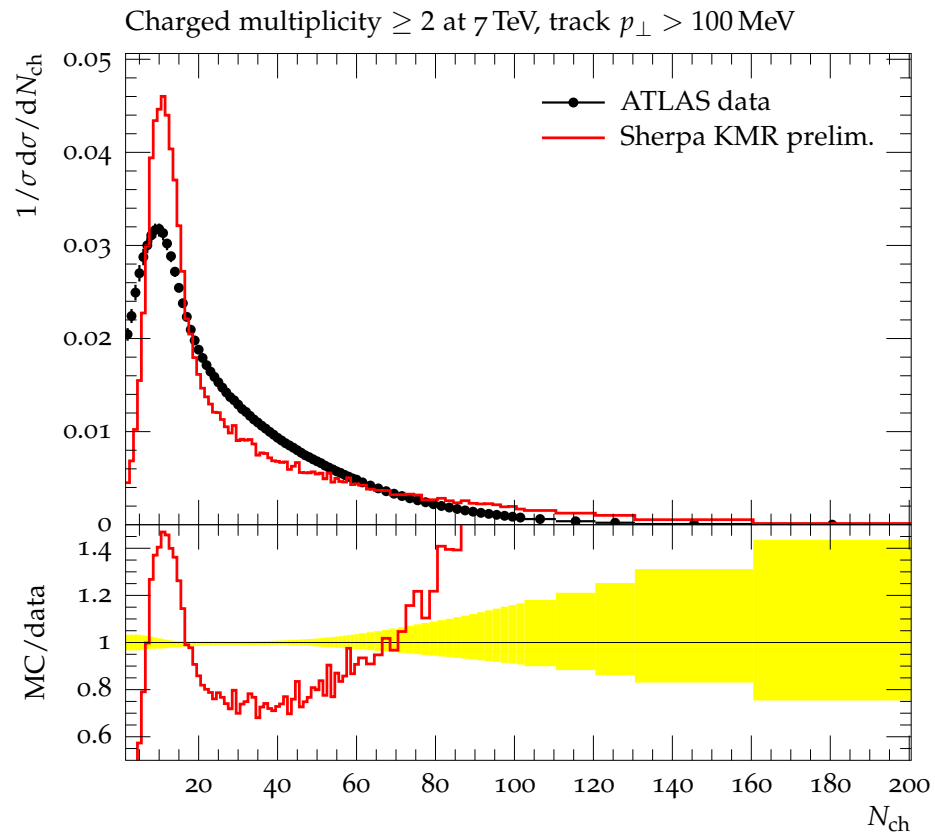
Very few free parameters, mostly constrained by total cross-section.

Doesn't differentiate between "diffractive" or "non-diffractive" – it just includes *everything*.

For details have a look at Frank Krauss' slides at MPI@LHC Glasgow 2010.

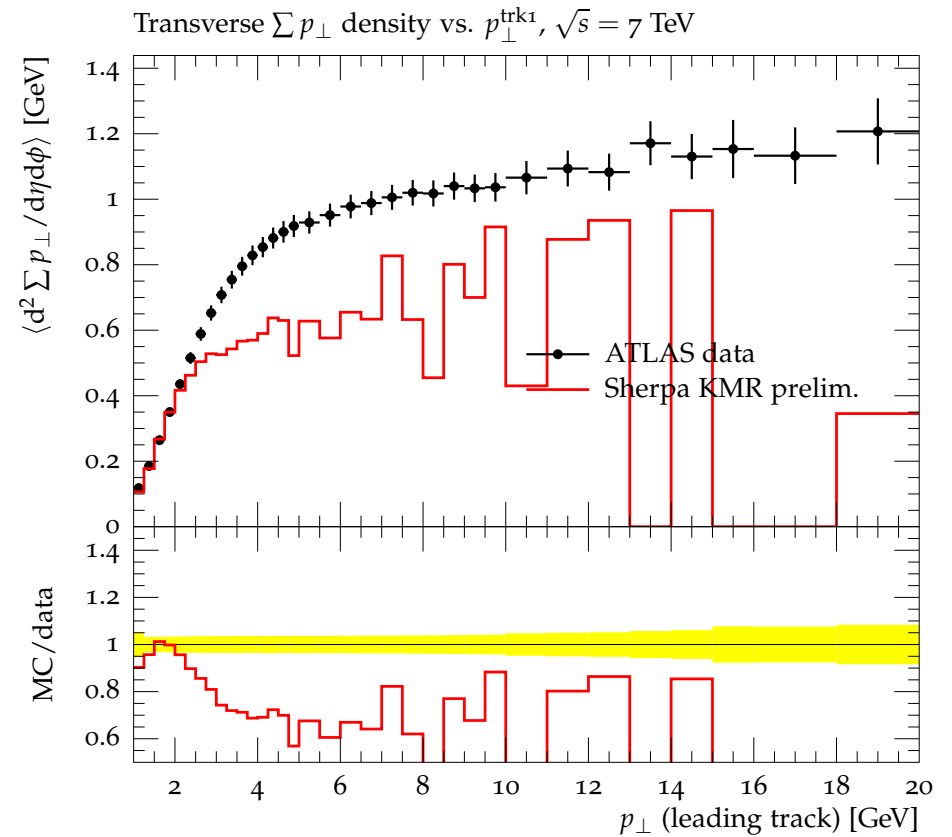
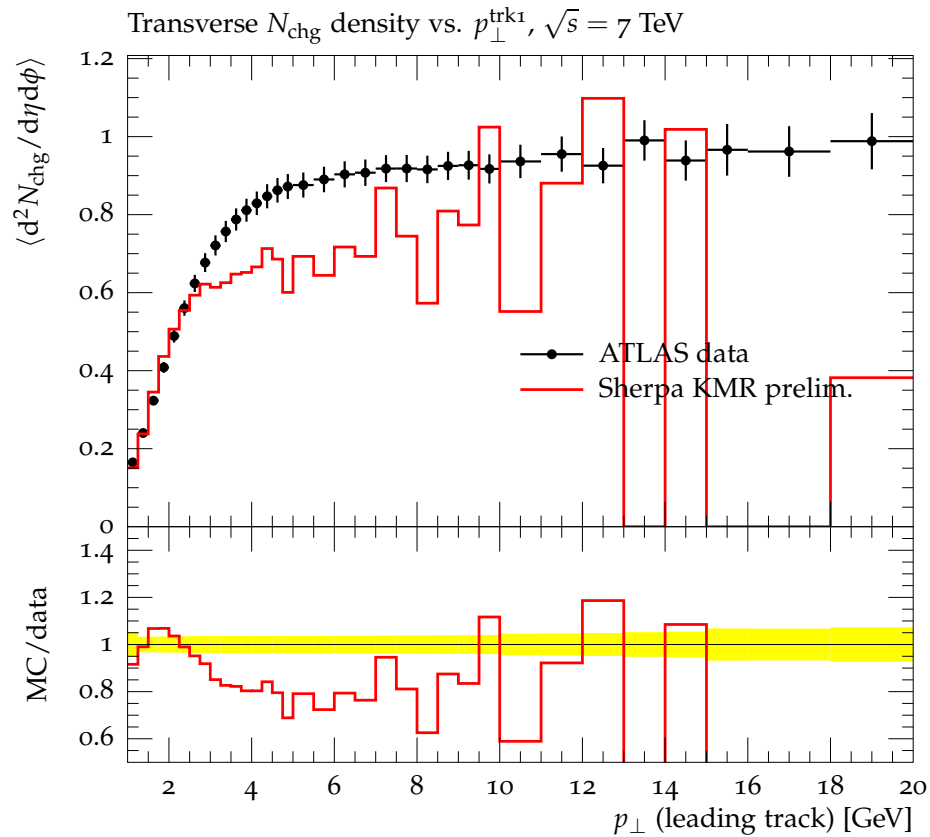
KMR Preview – Minimum Bias at 7 TeV (untuned)

arXiv:1012.5104



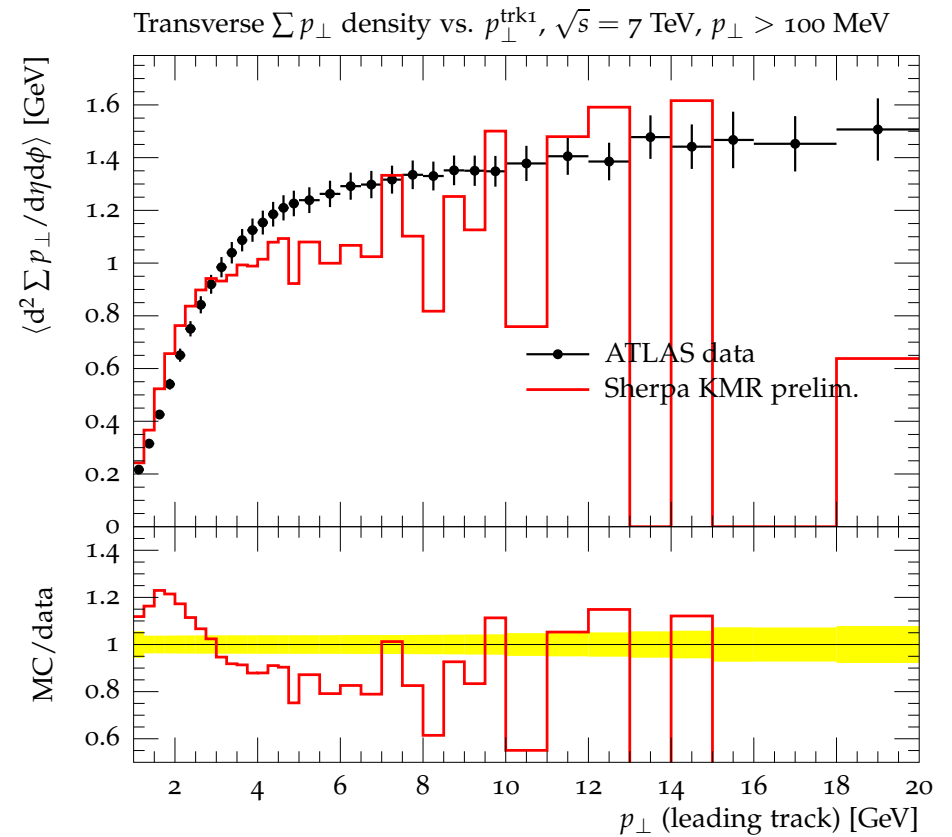
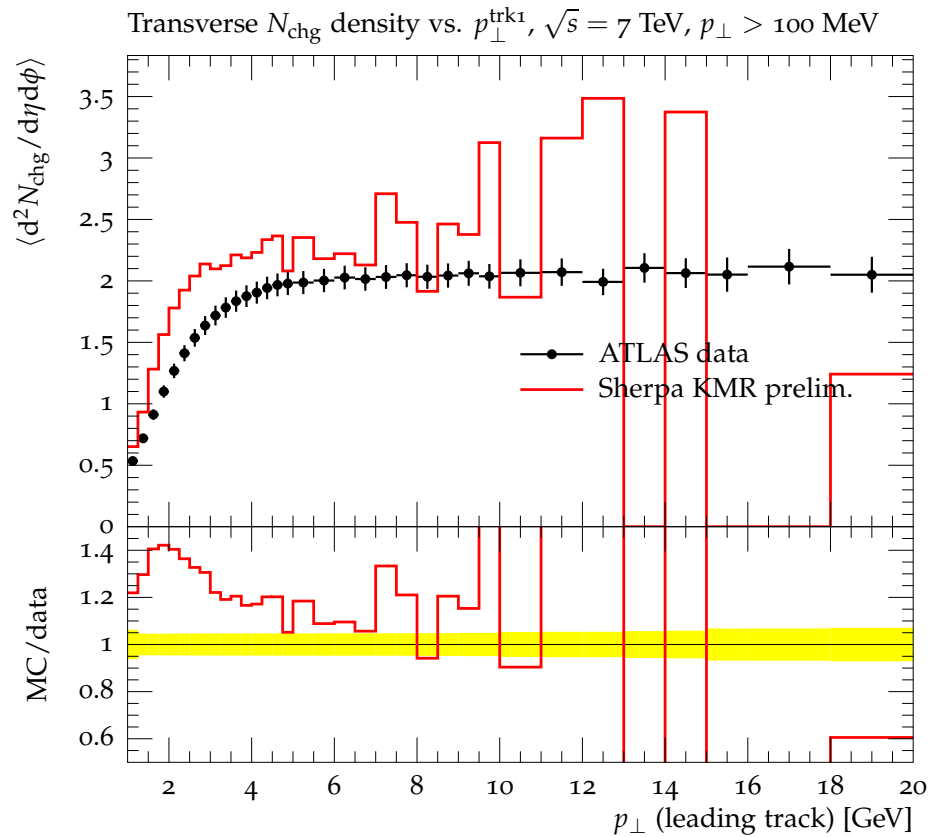
KMR Preview – Underlying Event at 7 TeV (untuned)

arXiv:1012.0791



KMR Preview – Underlying Event at 7 TeV (untuned)

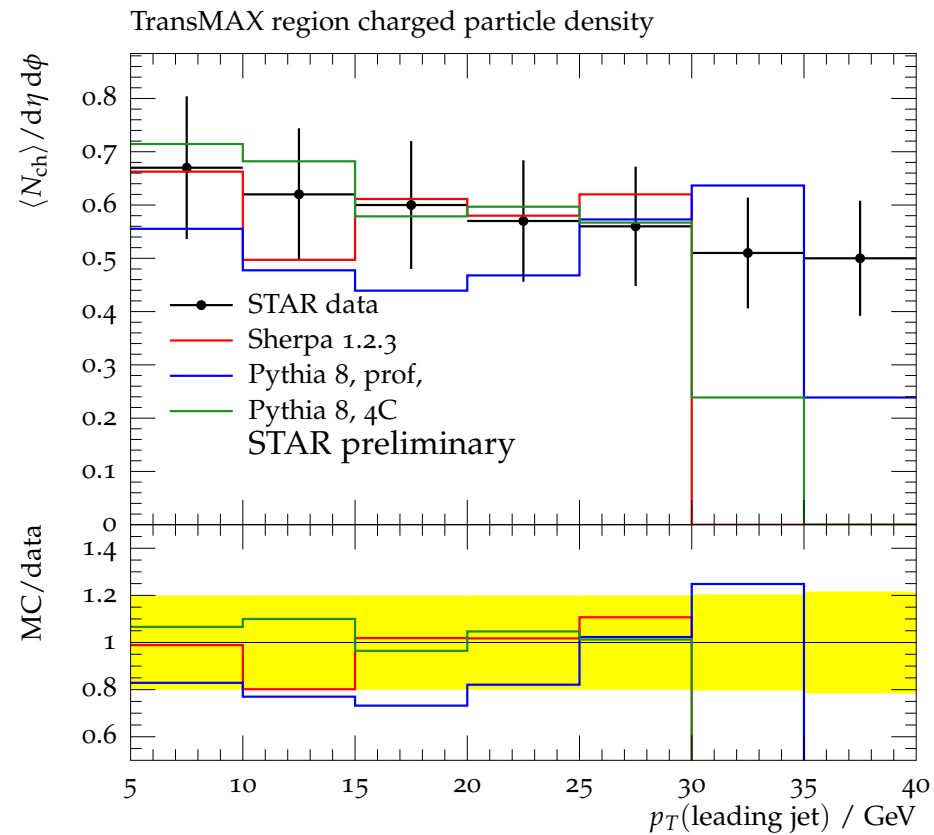
arXiv:1012.0791



Remarks on strangeness: STAR pp at 200 GeV

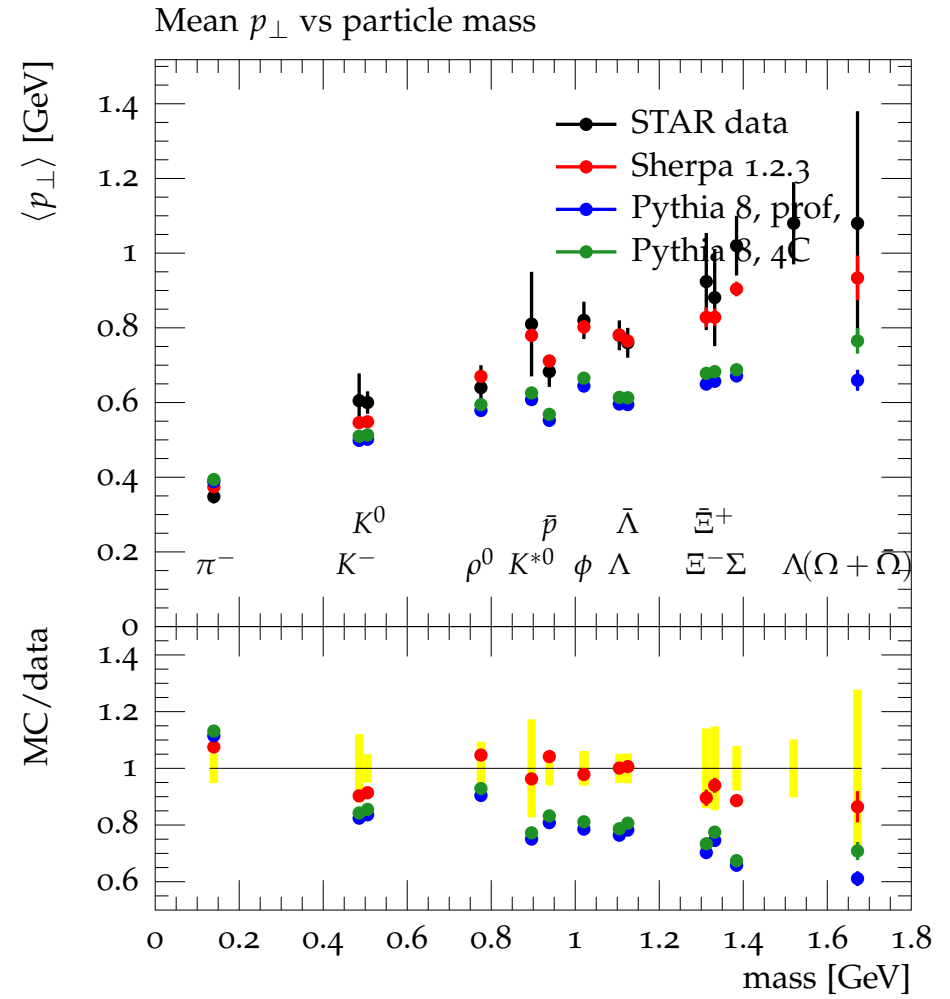
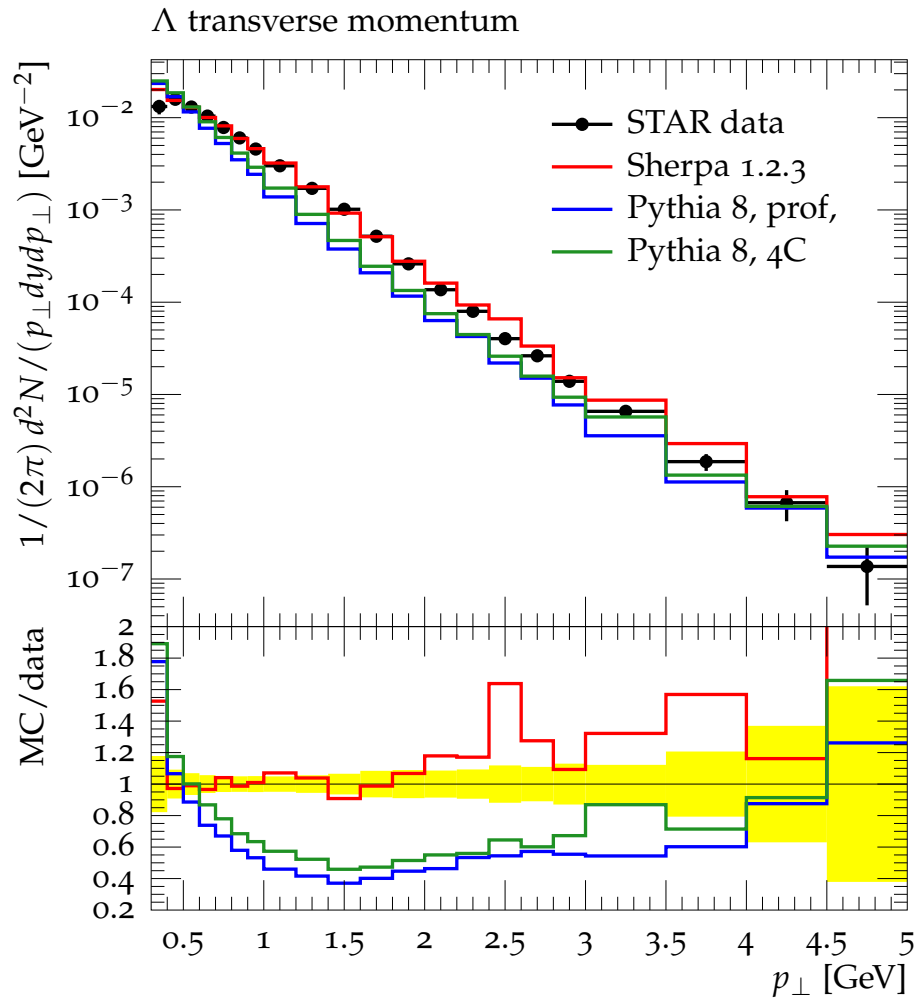
UE at RHIC 200 GeV pp

arXiv:0910.5203, arXiv:0907.3460



Strangeness at RHIC 200 GeV pp

Phys. Rev. C75, 064901



Summary

- Historically Sherpa's emphasis is not on minbias. Nevertheless, it does a reasonable job for the underlying event at LHC.
- We will release a new model for soft physics in Sherpa this year, which will be used for minimum bias and the underlying event.
- First results of the KMR model look promising, the limiting factor currently seems to be our hadronisation.