

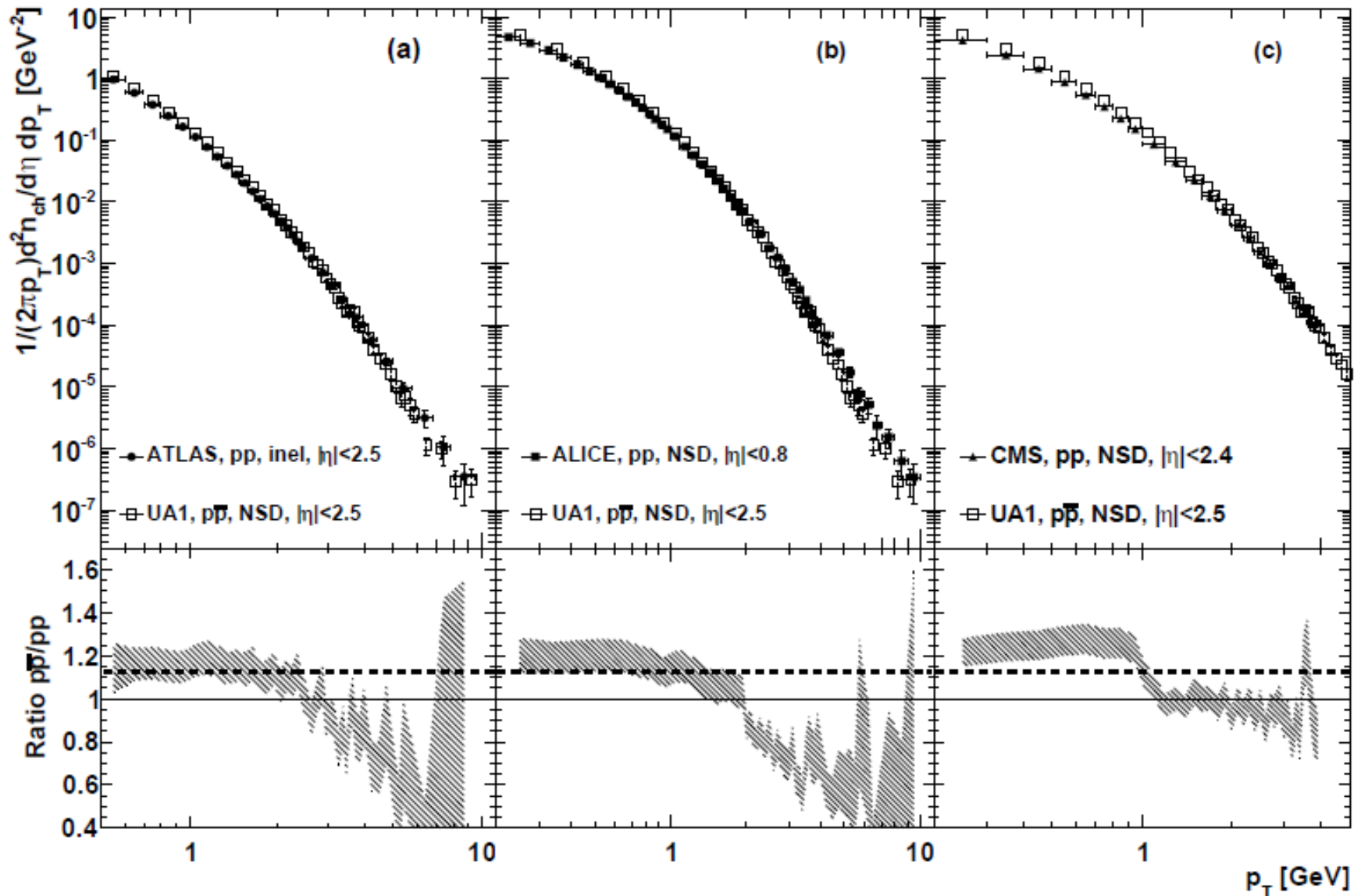
Comparison of the triggers of the ATLAS, ALICE and CMS experiments and the trigger of the UA1 experiment. Analysis of proton-proton and proton-antiproton interactions on basis of the MC event generator Pythia

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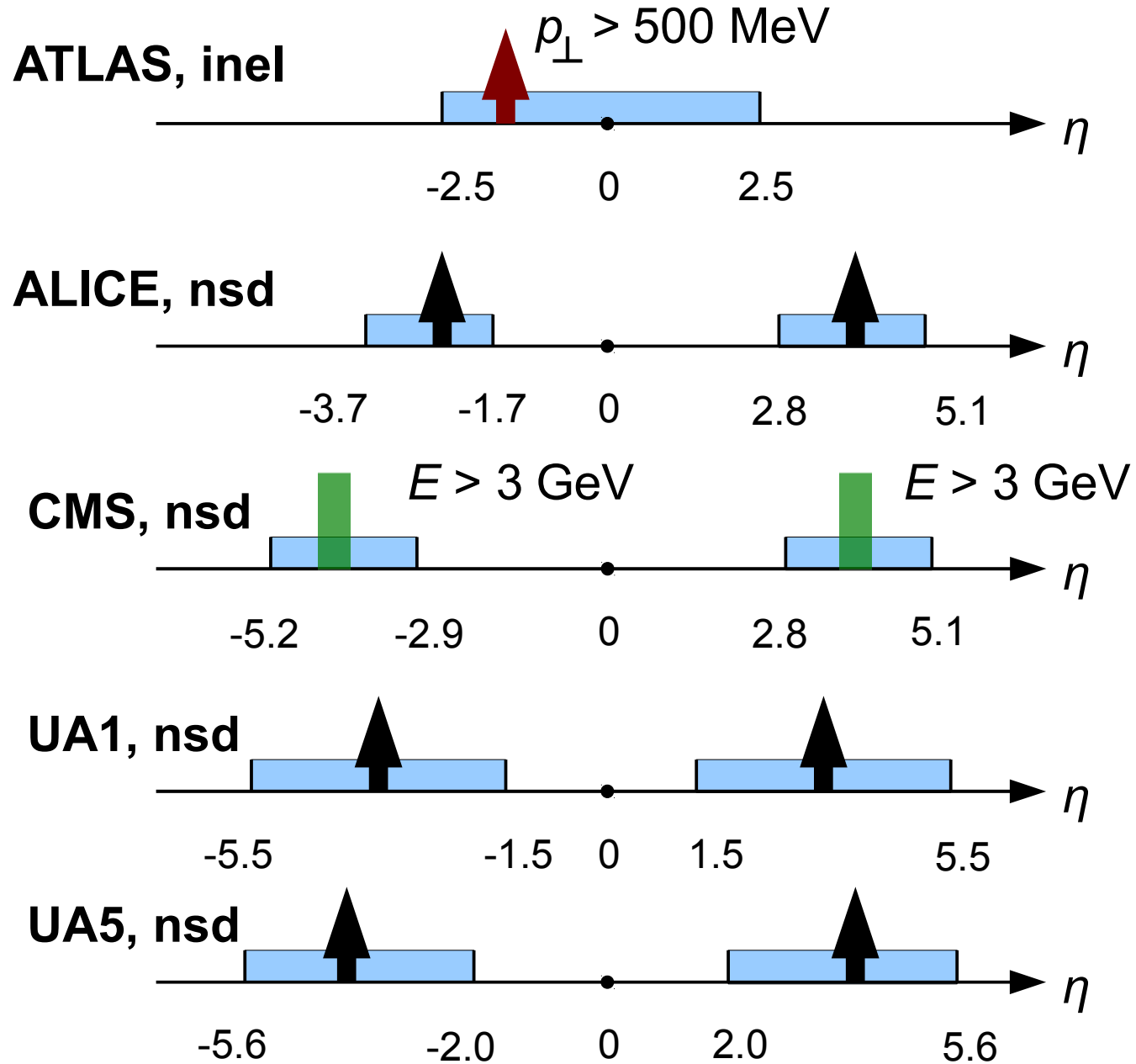
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The UA1 data (p+pbar) exceeds the ATLAS and ALICE data in 1.2 times and the CMS data in 1.3 times.



# Requirements used to collect the data (minimum bias triggers)



# Fractions of diffractive processes estimated by the MC generator Pythia

## Fraction of single-diffractive events in selected events (SD)

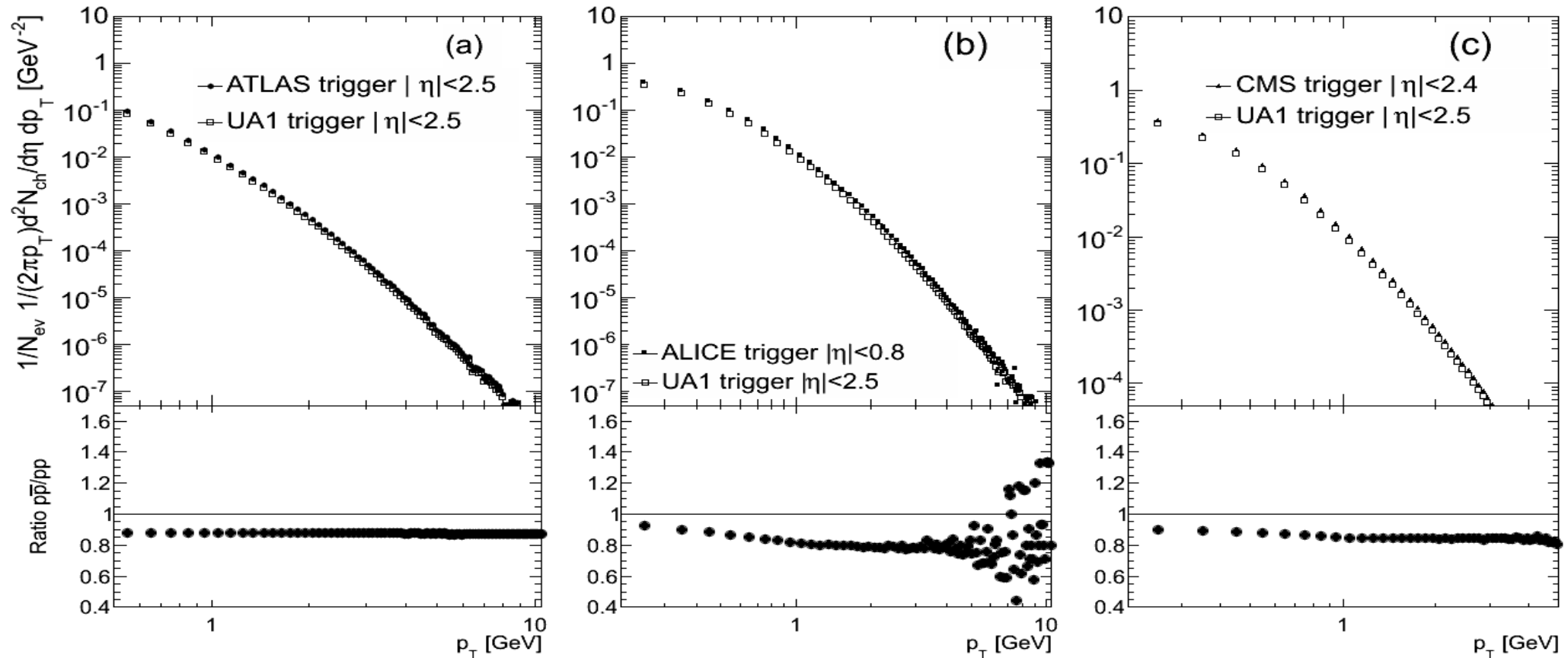
	PYTHIA, default	PYTHIA, Perugia 0	PYTHIA, Tune D6T
ATLAS	9.5%	8.0%	9.5%
ALICE	5.8%	5.4%	5.8%
CMS	4.3%	4.0%	4.2%
UA1	9.1%	9.3%	9.1%
UA5	6.3%	5.9%	6.3%

## Fraction of double-diffractive events in selected events (DD)

	PYTHIA, default	PYTHIA, Perugia 0	PYTHIA, Tune D6T
ATLAS	5.1%	4.3%	5.0%
ALICE	4.4%	4.1%	4.4%
CMS	4.7%	4.2%	4.6%
UA1	9.5%	9.4%	9.4%
UA5	6.3%	5.8%	6.2%

If data contains large fraction of diffractive events it tends to be lower than non diffractive data.

# The trigger effect on the transverse momentum distribution, Pythia, Perugia 0



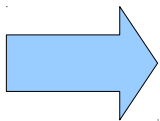
The ratio is below 1!

# The rejected triggers in the UA1 data

Events are retained for the analysis if they fulfil requirements on the timing of the trigger hodoscope, on the vertex reconstruction by the CD and on the total energy deposited in the calorimeter. These cuts reject background due to beam-gas interactions and halo particles that trigger the detector, and have been defined after a careful inspection of a number of events, taken in different beam conditions, with an interactive graphic display. The fraction of rejected triggers was 25% at 0.2 TeV and 12% at 0.9 TeV.

**UA1**

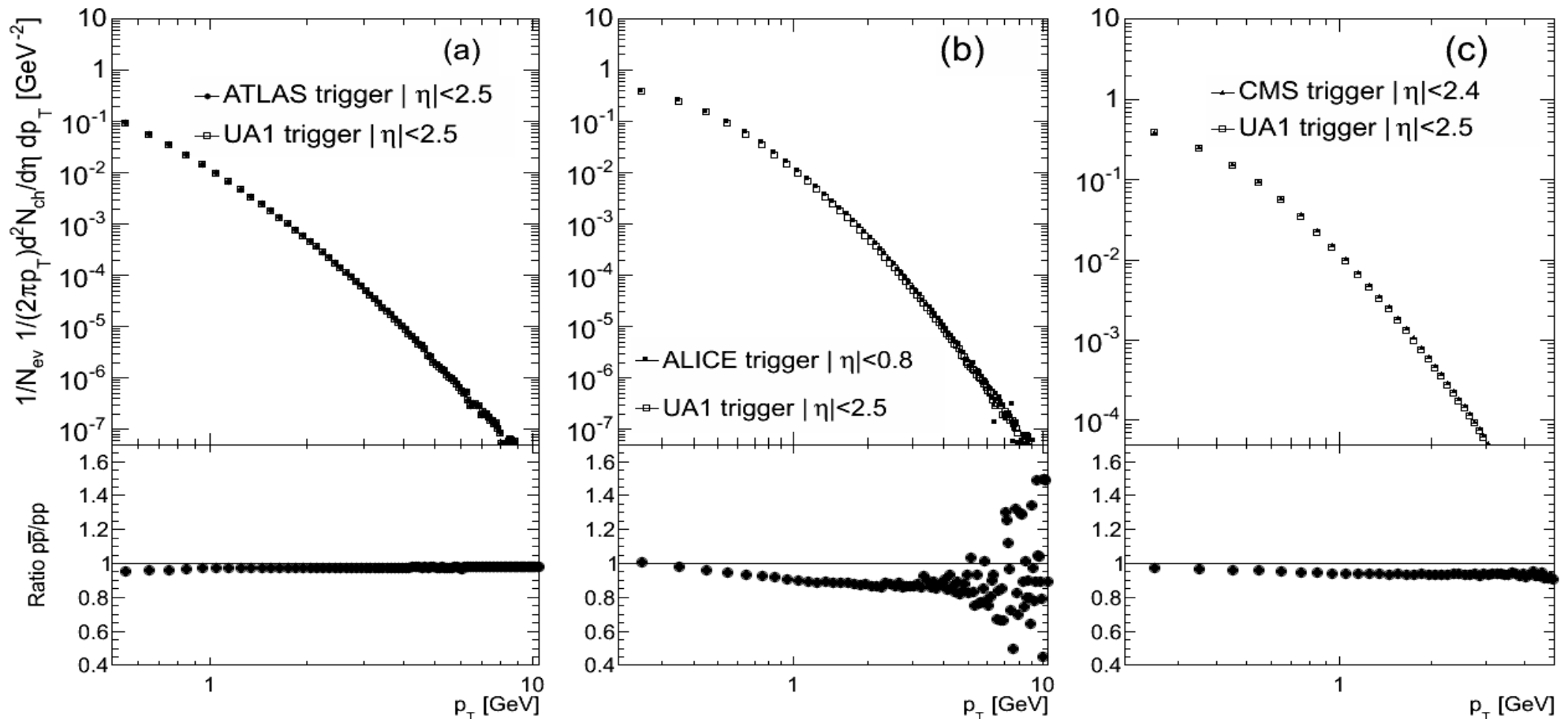
NPB 335 (1990) 261-287



In order to reproduce this feature we can randomly reject events with low multiplicities

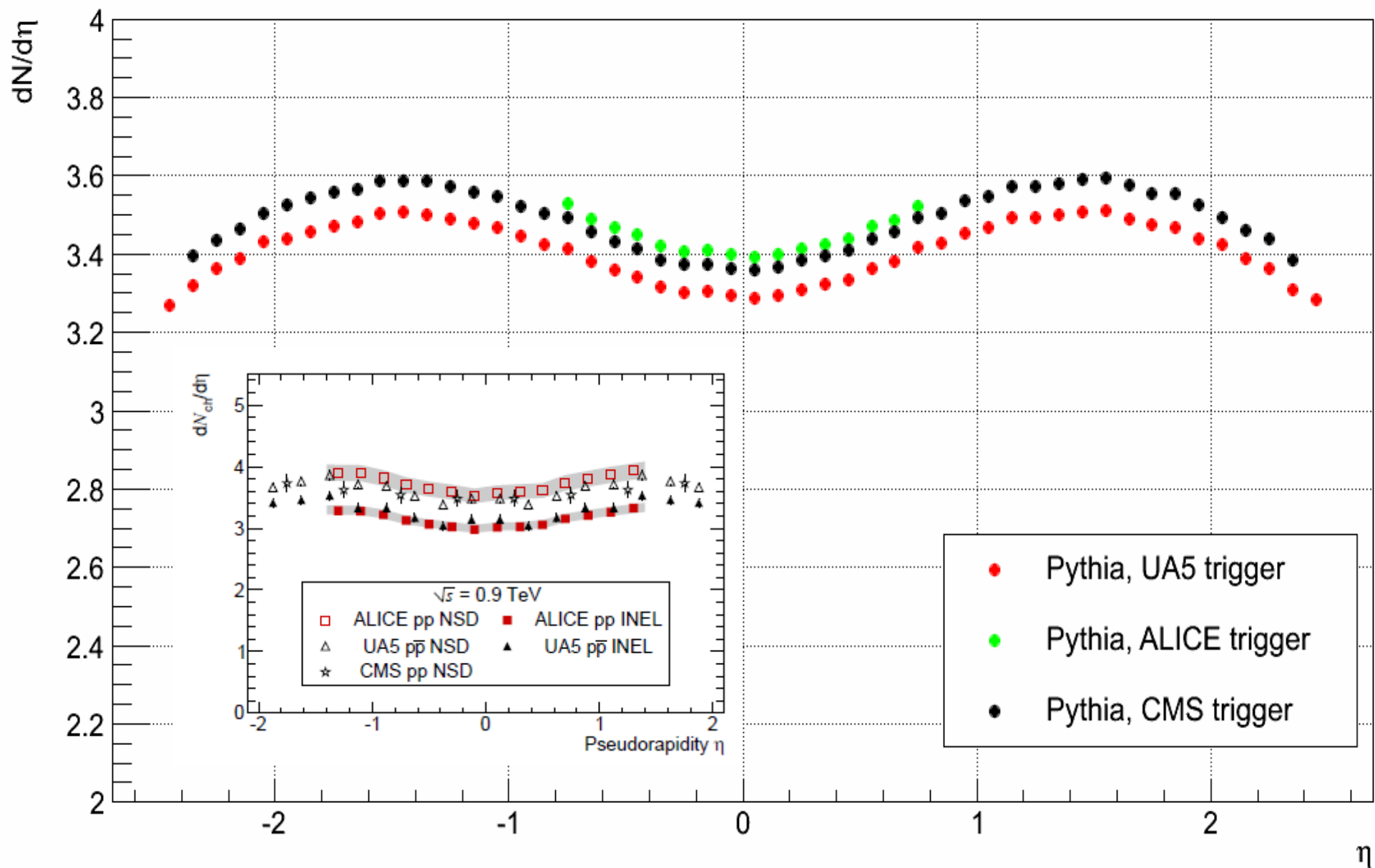
$$N_{ch} \leq 16$$

# The trigger effect + effect from rejected events with low multiplicities, Pythia, Perugia 0



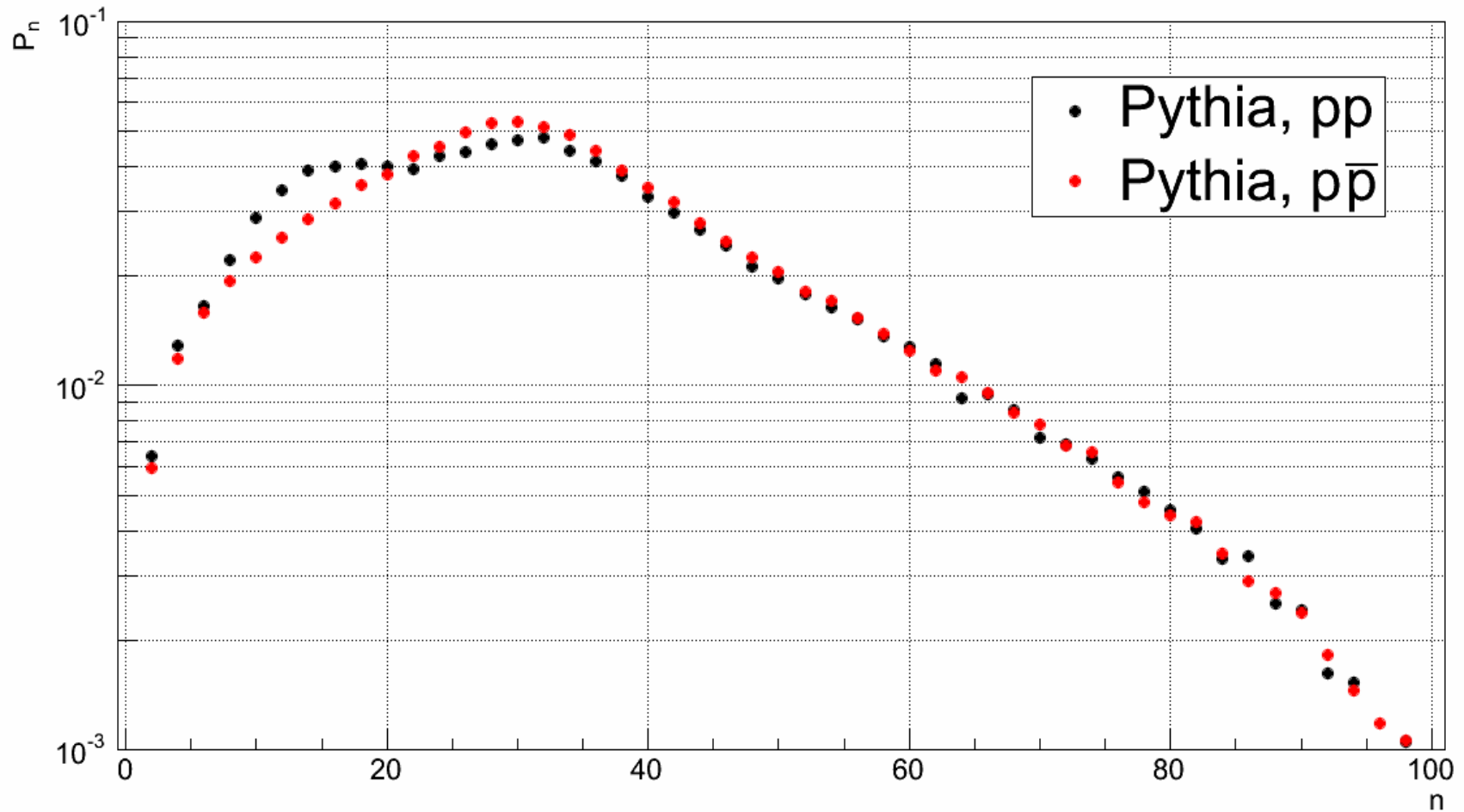
The ratio is close to 1  $\rightarrow$  these 2 effects cancel each other

# Possible trigger effect on the UA5 data

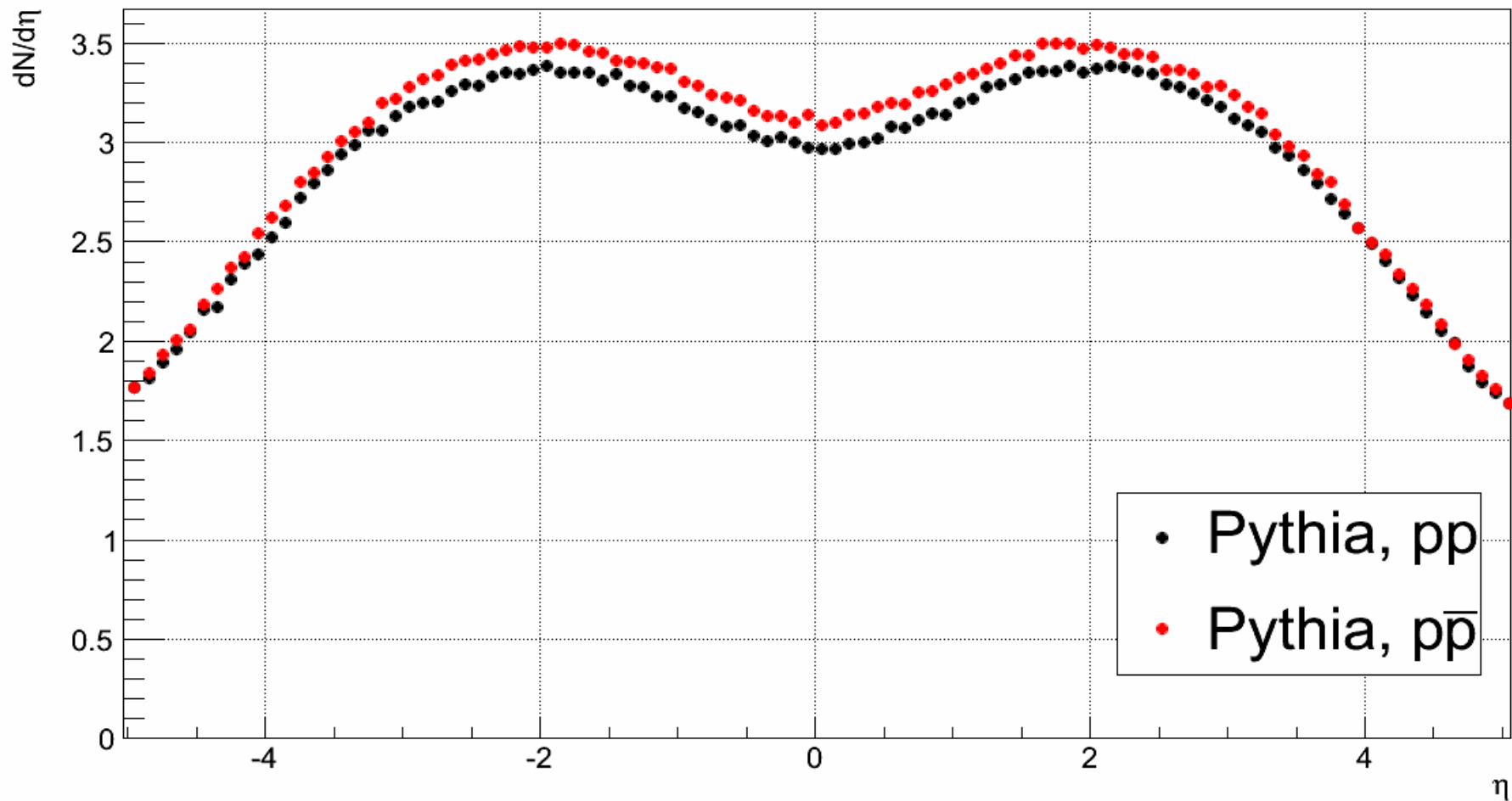




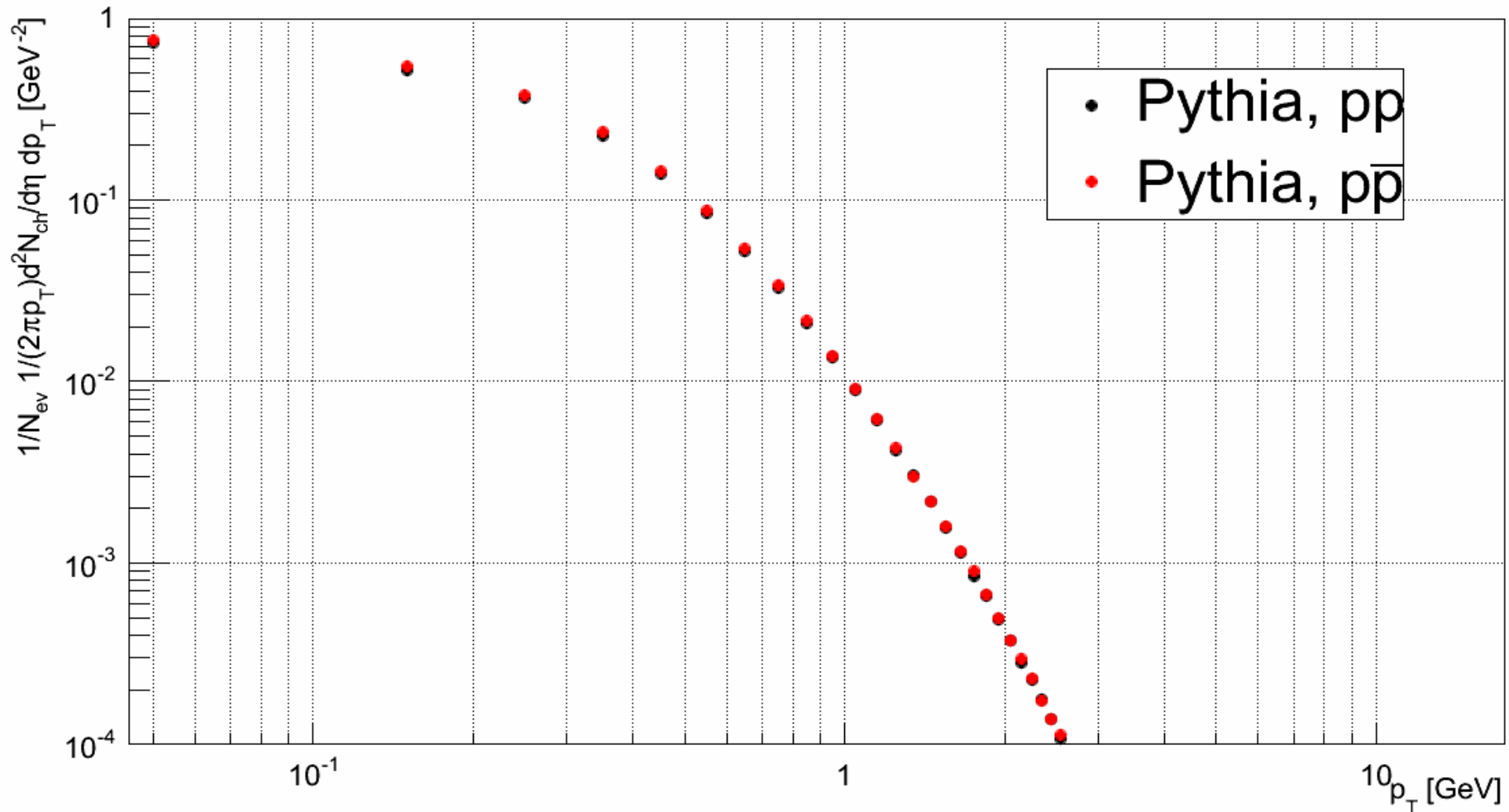
# Ambiguity in treating p+p and p+pbar in Pythia: multiplicity distribution in NSD events



# Ambiguity in treating p+p and p+pbar in Pythia: pseudorapidity density in NSD events



# Ambiguity in treating p+p and p+pbar in Pythia: transverse momentum distribution in NSD events



# Conclusions

- It is shown that the trigger effects can not explain the difference in inclusive distributions in proton-proton and proton-antiproton data at energy 900 GeV.
- There is some ambiguity in treating of proton-proton and proton-antiproton scattering in the widely used MC generator Pythia.

# Acknowledgement

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