

Gap fraction

Gap fraction vs Δy (FB) ($210 < p_T < 240$ ($Q_0 = \bar{p}_T$))

- ATLAS
- ▲ Pythia 8.186 default
- ★ Pythia 8.186 tune-4c
- ◻ Pythia 8.186 tune-4cx

2.5

2

1.5

1

0.5

0

Rivet 3.1.0, $\geq 100k$ events

mcplots.cern.ch [arXiv:1306.3436]

ATLAS_2011_S9126244

Ratio to ATLAS

2

1

0.5

2

0.5

0

2

4

6

$|\Delta y|$

The figure consists of two vertically stacked panels sharing a common x-axis representing the rapidity difference $|\Delta y|$ from 0 to 6. The top panel shows the 'Gap fraction' on the y-axis (0 to 2.5), comparing ATLAS data (black squares) with three Pythia 8.186 models: default (blue triangles), tune-4c (red stars), and tune-4cx (orange squares). The bottom panel shows the 'Ratio to ATLAS' on the y-axis (0.5 to 2), where the same models are plotted relative to the ATLAS data. A horizontal line is drawn at a ratio of 1.0. A yellow and green shaded region in the bottom panel highlights the area where the ratio deviates significantly from 1.0, particularly for $|\Delta y| > 4$. The ATLAS data points in the top panel show a general decrease in gap fraction as $|\Delta y|$ increases, with a notable drop to near zero at $|\Delta y| \approx 5.7$. The Pythia models generally follow this trend but show larger fluctuations, especially the tune-4c model which has a very high peak at $|\Delta y| \approx 4.7$.