

Gap fraction

Gap fraction vs Δy (LJ) ($240 < p_T < 270$)

- ATLAS
- - □ Herwig 7.2.0 default
- - ▲ Pythia 8.135 default
- - ◆ Sherpa 1.4.5 default

2

1.5

1

0.5

0

ATLAS_2011_S9126244

Rivet 3.1.0, $\geq 100k$ events

mcplots.cern.ch [arXiv:1306.3436]

Ratio to ATLAS

2

1

0.5

2

1

0.5

0

2

4

6

$|\Delta y|$

The figure displays two panels comparing ATLAS experimental data with Monte Carlo models for gap fraction and its ratio to ATLAS as a function of the rapidity gap $|\Delta y|$ (ranging from 0 to 6). The top panel shows the gap fraction, which decreases from approximately 0.9 at $|\Delta y| = 0.5$ to about 0.35 at $|\Delta y| = 4.8$. The bottom panel shows the ratio of the gap fraction to the ATLAS data, with a horizontal line at 1.0. The Herwig 7.2.0 model (green) and Pythia 8.135 model (blue) are shown with shaded uncertainty bands. The ATLAS data points (black squares) are also plotted in the bottom panel, showing a significant deviation from the ratio of 1.0 at larger $|\Delta y|$.

$ \Delta y $	ATLAS Gap Fraction	Herwig 7.2.0 Gap Fraction	Pythia 8.135 Gap Fraction	Sherpa 1.4.5 Gap Fraction	Herwig 7.2.0 Ratio to ATLAS	Pythia 8.135 Ratio to ATLAS	Sherpa 1.4.5 Ratio to ATLAS
0.5	0.95	0.95	0.90	0.95	1.00	0.95	1.00
1.0	0.80	0.80	0.75	0.80	1.00	0.95	1.00
1.5	0.65	0.65	0.55	0.60	1.00	0.85	0.90
2.0	0.55	0.55	0.40	0.50	1.00	0.75	0.95
2.5	0.45	0.45	0.35	0.40	1.00	0.80	0.95
3.0	0.35	0.35	0.25	0.35	1.00	0.65	1.10
3.5	0.30	0.30	0.20	0.25	1.00	0.40	0.75
4.0	0.30	0.20	0.15	0.35	1.00	0.45	1.20
4.5	0.35	0.15	0.65	0.45	1.00	1.95	1.35
5.0	0.35	-	0.65	0.45	1.00	1.95	1.35