

Gap fraction

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

- ATLAS
- - □ Herwig 7.2.0 default
- - ▲ Pythia 8.212 default
- - ◆ Sherpa 2.1.1 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 consists of two vertically stacked panels sharing a common x-axis representing the absolute rapidity difference $|\Delta y|$ from 0 to 6. The top panel shows the 'Gap fraction' on the y-axis, ranging from 0 to 2. It displays ATLAS data points (black squares) and three Monte Carlo model predictions: Herwig 7.2.0 (green dashed line with squares), Pythia 8.212 (blue solid line with triangles), and Sherpa 2.1.1 (red dotted line with diamonds). All models show a decreasing trend in gap fraction as $|\Delta y|$ increases, starting near 1.0 at $|\Delta y| \approx 0.5$ and reaching approximately 0.3-0.4 at $|\Delta y| \approx 4.8$. The bottom panel shows the 'Ratio to ATLAS' on the y-axis, ranging from 0.5 to 2.0. It uses the same data and model series as the top panel. A horizontal line is drawn at a ratio of 1.0. The Herwig and Sherpa models generally stay close to the ratio of 1.0, while the Pythia model shows a significant increase to a ratio of about 1.5 at $|\Delta y| \approx 4.3$. Shaded regions in the bottom panel indicate the uncertainty bands for the models: yellow for Herwig and green for Pythia.

$ \Delta y $	ATLAS Gap Fraction	Herwig 7.2.0 Gap Fraction	Pythia 8.212 Gap Fraction	Sherpa 2.1.1 Gap Fraction
0.5	0.95	0.95	0.95	0.95
1.0	0.80	0.80	0.80	0.80
1.5	0.65	0.65	0.65	0.65
2.0	0.55	0.55	0.55	0.55
2.5	0.45	0.45	0.45	0.45
3.0	0.35	0.35	0.35	0.35
3.5	0.35	0.35	0.35	0.35
4.0	0.30	0.30	0.30	0.30
4.3	0.35	0.20	0.45	0.20
4.8	0.35	0.25	0.40	0.25