

Gap fraction

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

- ATLAS
- - □ Herwig 7.1.0 default
- - ◆ Sherpa 2.2.8 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 Herwig 7.1.0 and Sherpa 2.2.8 Monte Carlo models for gap fractions in 7000 GeV pp collisions. The top panel shows the gap fraction (y-axis, 0 to 2) versus the rapidity gap $|\Delta y|$ (x-axis, 0 to 6). The bottom panel shows the ratio of the gap fraction to the ATLAS data (y-axis, 0.5 to 2) versus $|\Delta y|$ (x-axis, 0 to 6). The ATLAS data is represented by black squares. The Herwig 7.1.0 default model is shown as a green dashed line with open squares, and the Sherpa 2.2.8 default model is shown as a red dotted line with open diamonds. Shaded regions in the bottom panel represent the uncertainty bands for the Herwig (green) and Sherpa (yellow) models. The ATLAS data points generally show a decreasing trend in gap fraction as $|\Delta y|$ increases, with a notable spike at $|\Delta y| \approx 4.8$. The Herwig model follows the ATLAS data well at low $|\Delta y|$ but underpredicts the gap fraction at high $|\Delta y|$. The Sherpa model shows a similar trend but with a significant spike at $|\Delta y| \approx 4.8$.

$ \Delta y $	ATLAS Gap Fraction	Herwig 7.1.0 Ratio	Sherpa 2.2.8 Ratio
0.2	0.95	0.95	0.95
0.6	0.80	0.85	0.80
1.0	0.65	0.70	0.60
1.4	0.55	0.55	0.50
1.8	0.45	0.50	0.45
2.2	0.45	0.50	0.35
2.6	0.35	0.35	0.35
3.0	0.35	0.30	0.30
3.4	0.30	0.20	0.25
3.8	0.30	0.15	0.15
4.2	0.30	0.10	0.15
4.6	0.35	0.10	0.15
4.8	0.00	0.00	0.50