

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 absolute rapidity difference $|\Delta y|$ (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 points are 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 shows a general decrease in gap fraction with increasing $|\Delta y|$, with a notable spike at $|\Delta y| \approx 4.8$. The Herwig model generally follows the ATLAS data, while the Sherpa model shows a significant deviation 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	0.35	0.10	0.15
5.8	0.00	-	-