

Gap fraction

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

- ATLAS
- Herwig 7.2.0 default
- ▲ Pythia 8.210 default
- ◆ Sherpa 1.4.2 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 displays the 'Gap fraction' on the y-axis (0 to 2), comparing ATLAS experimental data (black squares) with three Monte Carlo models: Herwig 7.2.0 (green dashed line with squares), Pythia 8.210 (blue solid line with triangles), and Sherpa 1.4.2 (red dotted line with diamonds). All models show a general decrease 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 (0.5 to 2.0), where the same three models are plotted. A horizontal line is drawn at a ratio of 1.0. The Herwig model (green) stays near 1.0 until $|\Delta y| \approx 3.5$ before dropping significantly. The Pythia model (blue) remains close to 1.0 across the range. The Sherpa model (red) shows more variation, with a peak around $|\Delta y| \approx 3.8$. Shaded regions in the bottom panel indicate the uncertainty bands for the Herwig (green) and Pythia (yellow) models.