

Gap fraction

Gap fraction vs  $\Delta y$  (LJ) ( $240 < p_T < 270$ )

- ATLAS
- Herwig 7.2.0 default
- ▲ Pythia 8.170 default
- ◆ Sherpa 1.4.0 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

0.5

0

2

4

6

$|\Delta y|$

The figure consists of two vertically stacked panels sharing a common x-axis representing the rapidity difference  $|\Delta y|$  from 0 to 6. The top panel displays the gap fraction, with the y-axis ranging from 0 to 2. It compares ATLAS experimental data (black squares) with three Monte Carlo models: Herwig 7.2.0 (green dashed line with open squares), Pythia 8.170 (blue solid line with solid triangles), and Sherpa 1.4.0 (red dotted line with solid diamonds). All models show a general decrease in gap fraction as  $|\Delta y|$  increases, with a notable dip around  $|\Delta y| \approx 3.5$ . The bottom panel shows the ratio of the Monte Carlo models to the ATLAS data, with the y-axis ranging from 0.5 to 2. A horizontal line is drawn at a ratio of 1.0. Shaded regions in yellow and green represent uncertainty bands for the models. The Sherpa model (red) shows a significant peak in the ratio at  $|\Delta y| \approx 4.8$ , reaching a value of 2.0.