

Gap fraction

Gap fraction vs  $\Delta y$  (FB) ( $210 < p_T < 240$  ( $Q_0 = \bar{p}_T$ ))

- ATLAS
- - □ Herwig 7.2.0 default
- - ◆ Sherpa 1.4.5 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). It compares ATLAS experimental data (black solid squares) with two Monte Carlo models: Herwig 7.2.0 default (green dashed line with open squares) and Sherpa 1.4.5 default (red dotted line with open diamonds). Both models show a decreasing trend in gap fraction as  $|\Delta y|$  increases, starting near 1.0 and dropping to approximately 0.4-0.5 at  $|\Delta y| = 5$ . The ATLAS data points are scattered around the model predictions. The bottom panel displays the 'Ratio to ATLAS' on the y-axis (0.5 to 2). It shows the same data points as the top panel, but the y-axis represents the ratio of the model prediction to the ATLAS data. A horizontal line is drawn at a ratio of 1.0. The Herwig model (green) stays closer to 1.0 than the Sherpa model (red), which shows a significant increase in ratio (up to ~1.6) at  $|\Delta y| = 5$ . A histogram in the bottom right of the lower panel shows the distribution of the ratio to ATLAS, with a peak around 1.0 and a tail extending to higher ratios.