

Gap fraction

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

- ATLAS
- - □ Herwig 7.2.0 default
- - ▲ Pythia 8.130.p1 default
- - ◆ Sherpa 1.3.0 default

2.5

2

1.5

1

0.5

0

Rivet 3.1.0,  $\geq 100k$  events

mcplots.cern.ch [arXiv:1306.3436]

ATLAS\_2011\_S9126244

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 shows the 'Gap fraction' on the y-axis (0 to 2.5), and the bottom panel shows the 'Ratio to ATLAS' on the y-axis (0.5 to 2). Both panels compare ATLAS experimental data (black squares) with three Monte Carlo models: Herwig 7.2.0 (green dashed line with open squares), Pythia 8.130.p1 (blue solid line with solid triangles), and Sherpa 1.3.0 (red dotted line with solid diamonds). Error bars are shown for all data points. The bottom panel also features a 2D histogram in the background, with green and yellow regions indicating the distribution of the ratio to ATLAS. The ATLAS data points in the top panel show a general downward trend from a gap fraction of 1.0 at  $|\Delta y| \approx 0.5$  to approximately 0.3 at  $|\Delta y| \approx 5.8$ . The MC models generally follow this trend but with varying degrees of agreement and uncertainty.

$ \Delta y $	ATLAS Gap Fraction	Herwig 7.2.0 Gap Fraction	Pythia 8.130.p1 Gap Fraction	Sherpa 1.3.0 Gap Fraction
0.5	1.0	1.0	1.0	1.0
1.0	0.95	1.0	0.9	0.95
1.5	0.95	0.95	1.0	0.95
2.2	0.9	0.85	0.9	1.0
2.8	0.85	0.85	0.9	0.85
3.3	0.85	0.75	0.9	0.9
3.8	0.8	0.65	0.85	0.85
4.3	0.7	0.65	1.0	0.7
4.8	0.45	0.4	0.4	0.8
5.3	0.35	0.35	0.35	1.0
5.8	0.0	-	-	-