

Gap fraction

Gap fraction vs  $\Delta y$  (FB) ( $90 < p_T < 120$  ( $Q_0 = \bar{p}_T$ ))

- ATLAS
- △— Pythia 6.428 370
- - -■- - - Pythia 6.428 default

2

1.8

1.6

1.4

1.2

1.0

0.8

0.6

0.4

0.2

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

0.5

0 2 4 6

$|\Delta y|$

The figure displays two panels comparing ATLAS experimental data with Pythia 6.428 model predictions for gap fractions in 7000 GeV pp collisions. The top panel shows the gap fraction as a function of rapidity difference  $|\Delta y|$  (ranging from 0 to 6). The bottom panel shows the ratio of the gap fraction to the ATLAS data, also as a function of  $|\Delta y|$ . The ATLAS data (black squares) shows a gap fraction that starts near 1.0 at  $|\Delta y| \approx 0.5$  and generally decreases to about 0.55 at  $|\Delta y| \approx 5.8$ . The Pythia 6.428 370 model (red triangles) follows the ATLAS data closely, while the Pythia 6.428 default model (orange squares) shows a significant dip to approximately 0.5 at  $|\Delta y| \approx 4.8$ . The bottom panel shows that the ratio of the models to the ATLAS data is mostly around 1.0, with the default model showing a ratio of about 0.8 at  $|\Delta y| \approx 4.8$ . A shaded region in the bottom panel indicates a range of ratios between approximately 0.8 and 1.3 for  $|\Delta y| > 4.5$ .

| $ \Delta y $ | ATLAS Gap Fraction | Pythia 6.428 370 Gap Fraction | Pythia 6.428 default Gap Fraction | Ratio to ATLAS (370) | Ratio to ATLAS (default) |
|--------------|--------------------|-------------------------------|-----------------------------------|----------------------|--------------------------|
| 0.5          | 1.00               | 0.98                          | 0.98                              | 1.00                 | 1.00                     |
| 1.0          | 0.95               | 0.96                          | 0.96                              | 1.00                 | 1.00                     |
| 1.5          | 0.92               | 0.90                          | 0.90                              | 0.98                 | 0.98                     |
| 2.0          | 0.91               | 0.88                          | 0.88                              | 0.97                 | 0.97                     |
| 2.5          | 0.86               | 0.87                          | 0.88                              | 0.99                 | 1.01                     |
| 3.0          | 0.83               | 0.79                          | 0.76                              | 0.95                 | 0.91                     |
| 3.5          | 0.78               | 0.78                          | 0.78                              | 1.00                 | 1.00                     |
| 4.0          | 0.74               | 0.72                          | 0.72                              | 0.97                 | 0.97                     |
| 4.5          | 0.68               | 0.66                          | 0.51                              | 0.97                 | 0.75                     |
| 5.0          | 0.61               | 0.75                          | 0.67                              | 1.23                 | 1.12                     |
| 5.5          | 0.54               | 0.67                          | 0.67                              | 1.24                 | 1.24                     |