

Z+Jet

Figure 1 displays the multiplicity distribution of jets in CMS and Monte Carlo models. The top panel shows the distribution of the number of jets, N , as a function of multiplicity. The bottom panel shows the ratio of the Monte Carlo models to the CMS data.

Top Panel: Multiplicity λ_0 (CMS jet substructure)

The top panel shows the distribution of the number of jets, N , as a function of multiplicity. The x-axis is multiplicity (0 to 60), and the y-axis is $1/N \cdot dN/dp_T$ (0 to 180). The data points are shown for CMS (black squares) and Monte Carlo models (Herwig++ 2.6.1a default, orange dashed line with circles; Herwig 7.2.1 default, green dashed line with squares). The CMS data points are very low, while the Monte Carlo models show a peak around multiplicity 20.

Bottom Panel: Ratio to CMS

The bottom panel shows the ratio of the Monte Carlo models to the CMS data. The x-axis is multiplicity (0 to 60), and the y-axis is the ratio (0.5 to 2). The ratio is shown for Herwig++ 2.6.1a default (orange) and Herwig 7.2.1 default (green). The ratio is generally above 1, indicating that the Monte Carlo models predict a higher multiplicity than the CMS data.

Multiplicity	CMS $1/N \cdot dN/dp_T$	Herwig++ 2.6.1a $1/N \cdot dN/dp_T$	Herwig 7.2.1 $1/N \cdot dN/dp_T$	Ratio (Herwig++/CMS)	Ratio (Herwig/CMS)
0	0	0	0	0	0
5	0	15	12	1.5	1.2
10	0	75	75	7.5	7.5
20	0	75	82	7.5	8.2
25	0	40	45	4.0	4.5
35	0	10	10	1.0	1.0
50	0	0	0	0	0

Rivet 3.1.10, $\geq 300k$ events

mcplots.cern.ch [arXiv:1306.3436]

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multiplicity