Event Selection Criteria

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Selection Criteria

- C1: Limit clusters in first layer so that event is rejected if any hits lie outside a central box of pixels (nominally 125 pixels wide)
- C2: Perform clustering in first layer, only accept events with one accepted cluster
- C3: If any of the clusters in C2 that were rejected have a cluster size greater than 1, reject the event
- C4: Reject event if there are hits in the second layer outside a 120 pixel radius circle behind centre of accepted cluster in first layer.

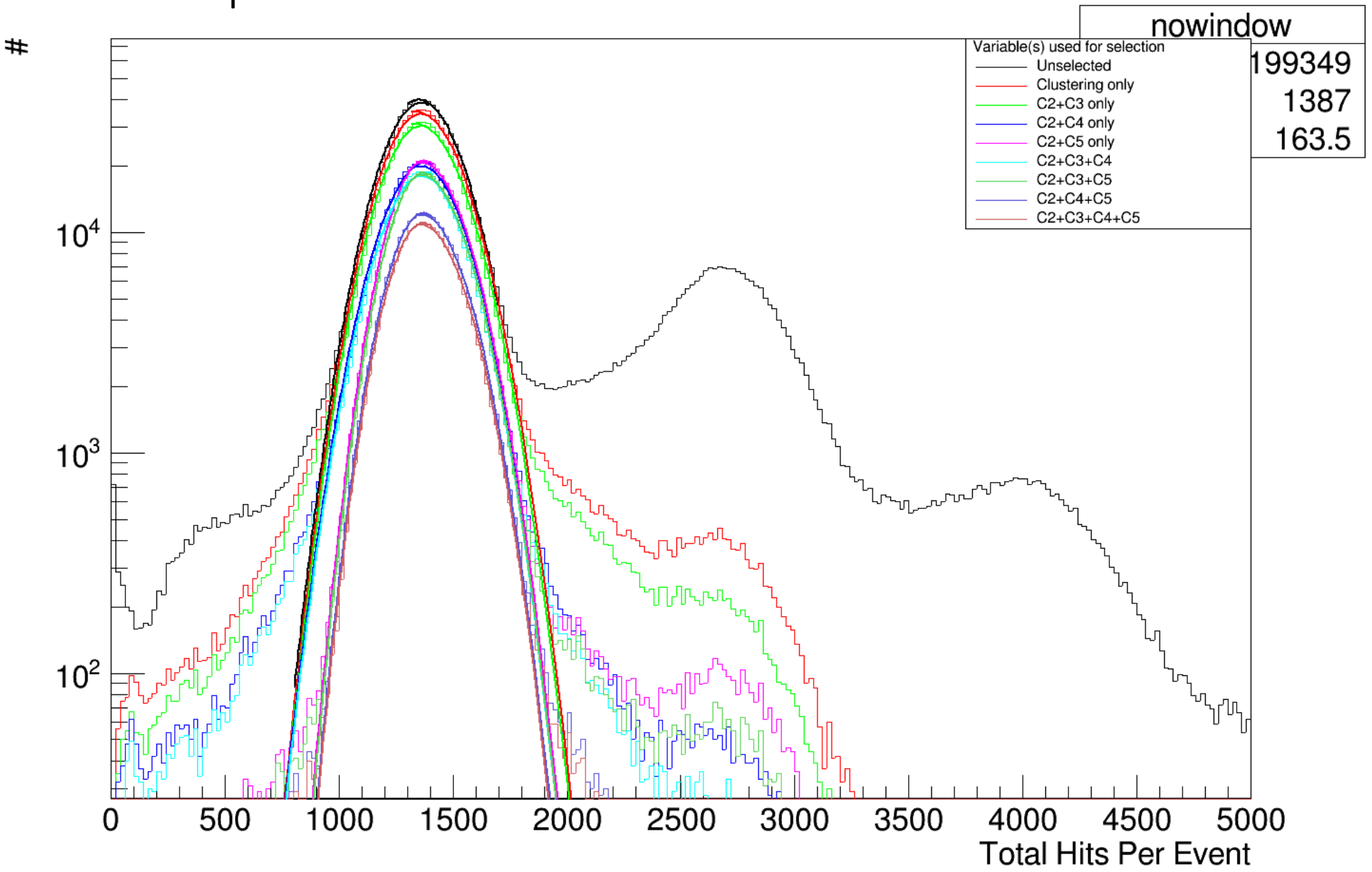
Selection Criteria

- C5:
  - Count hits in 3rd to 10th layer
  - Count hits inside a circle (80 pixel radius) behind centre of accepted cluster
  - Count hits within 170 pixels of the edge of the layer
  - Reject cluster if: $\frac{N_{Border}^{Hits}}{N_{Circle}^{Hits}} > 0.15$

Finding Asymmetry

- Find the peak bin in the distribution of total hits
- Two gaussian fits: one to the left of this bin, one to the right of this bin, with a small overlap.
- Restrict the mean of the distribution to within the peak bin
- Compute asymmetry as $A = \sigma_{Left} - \sigma_{Right}$
- +ve value indicates peak has shifted to the right (left-skewed)
- -ve value indicates peak has shifter to the left (right-skewed)
- Once again using Run 1413 as a benchmark:

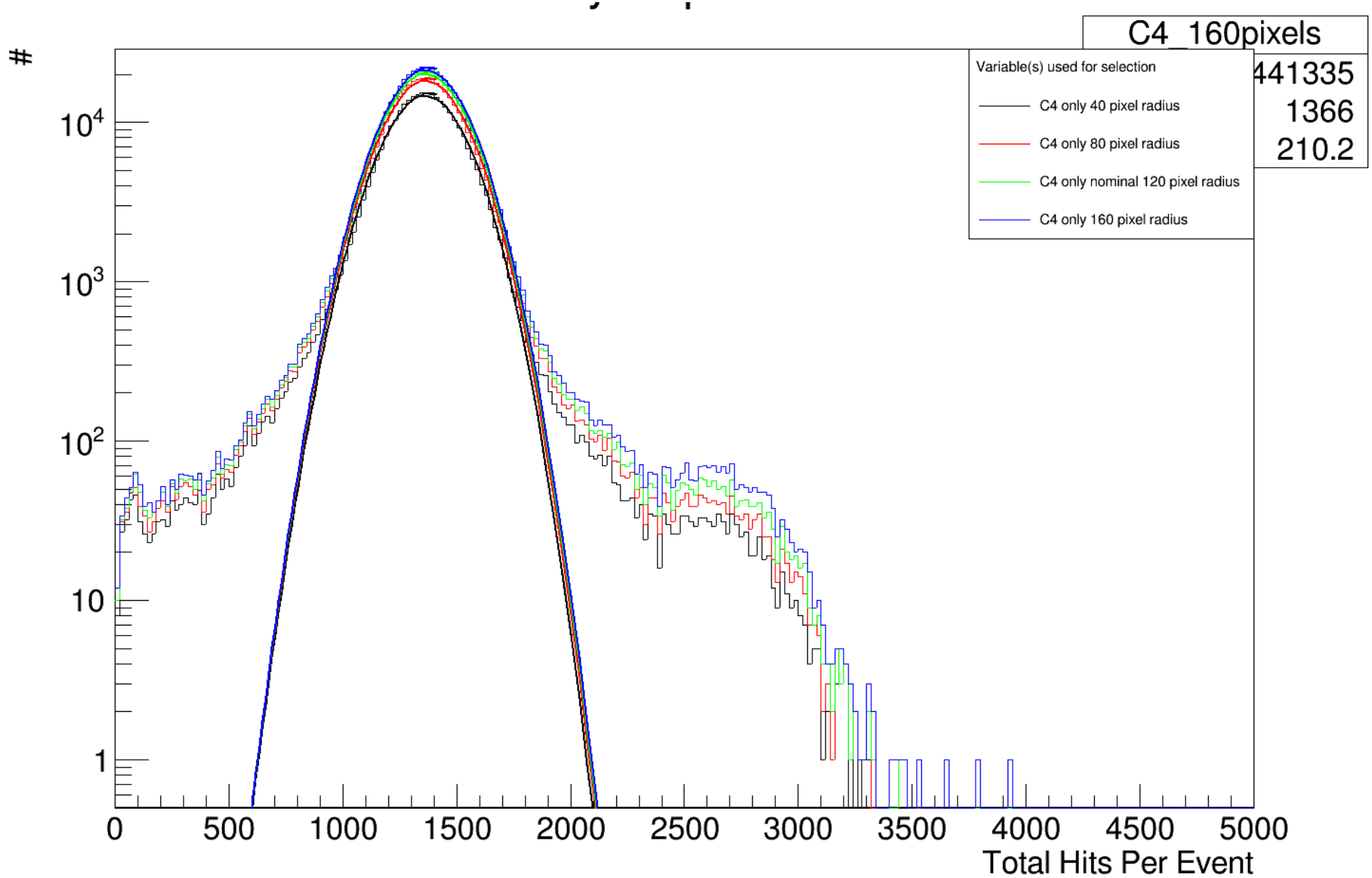
Comparison of Criteria Combinations



Energy Resolution & Proportion remaining

Criteria	$\bar{N}$	**Fraction of events remaining**	**Left-Right Asymmetry**
None	1368	100%	-9.38
C2	1367	67.024%	-20.63
C2+C3	1366	58.391%	-19.42
C2+C4	1363	37.590%	5.30
C2+C5	1387	35.112%	-30.54
C2+C3+C4	1363	33.767%	6.13
C2+C3+C5	1387	30.816%	-30.41
C2+C4+C5	1385	20.091%	-28.80
C2+C3+C4+C5	1385	18.061%	-28.67

C4: vary radius of selection



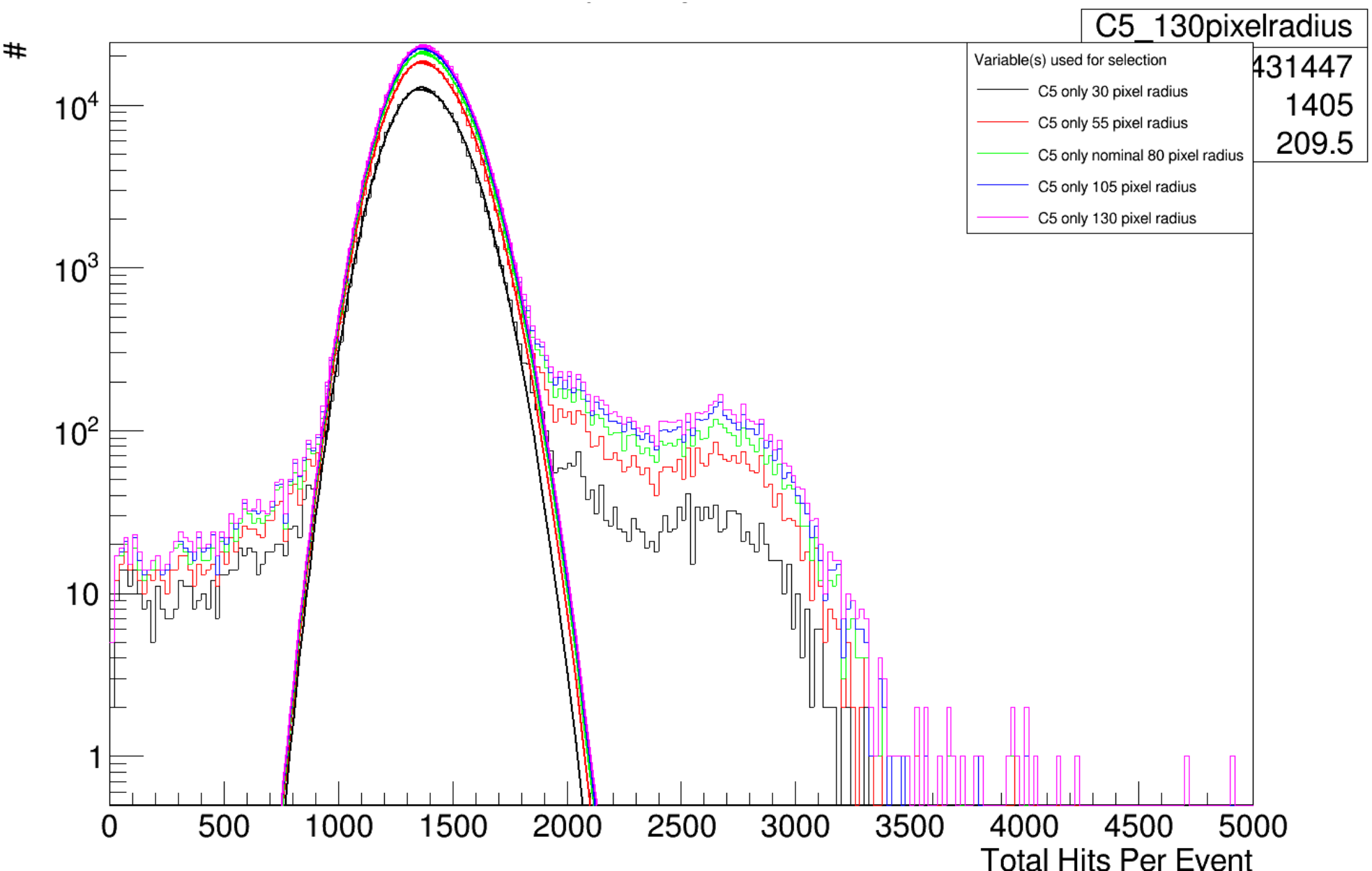
C4: vary radius of selection

C2+C4 **C4 radius (pixels)**	$\bar{N}$	**Fraction of events remaining**	**Left-Right Asymmetry**
No criteria	1368	100%	-9.38
40	1360	27.503%	8.97
80	1362	34.078%	6.84
120	1363	37.590%	5.30
160	1364	39.985%	4.44

‘Nominal’ parameter value (as preset by Aart) highlighted in red.
Fits done to two split Gaussians

C5: vary radius of selection

$$\frac{N_{Border}^{Hits}}{N_{Circle}^{Hits}} > 0.15$$



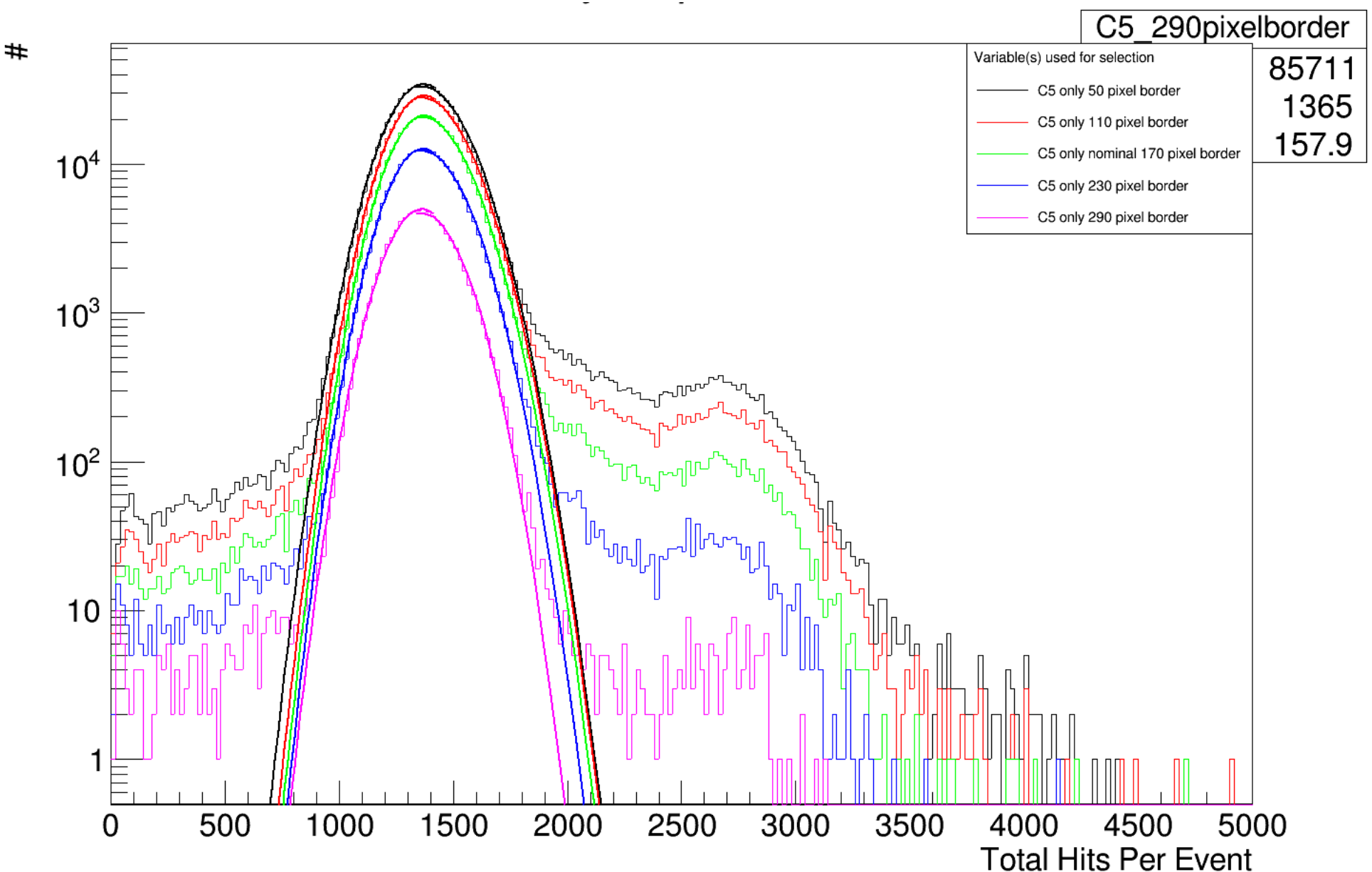
C5: vary radius of selection

C2+C5 **C5 radius (pixels)**	$\bar{N}$	**Fraction of events remaining**	**Left-Right Asymmetry**
No criteria	1368	100%	-9.38
30	1378	20.836%	-24.63
55	1385	30.547%	-28.75
80	1387	35.112%	-30.54
105	1388	37.581%	-31.16
130	1389	39.090%	-31.72

‘Nominal’ parameter value (as preset by Aart) highlighted in red.
Fits done to two split Gaussians

C5: vary border of selection

$$\frac{N_{Border}^{Hits}}{N_{Circle}^{Hits}} > 0.15$$



C5: vary border size of selection

C2+C5 C5 border (pixels)	$\bar{N}$	**Fraction of events remaining**	**Left-Right Asymmetry**
No criteria	1368	100%	-9.38
50	1379	60.082%	-24.48
110	1386	48.765%	-30.65
170	1387	35.112%	-30.54
230	1381	20.527%	-26.41
290	1364	7.766%	-12.60

‘Nominal’ parameter value (as preset by Aart) highlighted in red.
Fits done to two split Gaussians