CFT Tracking Performance with AFEI and AFEII-t Modules

D0 CFT Group

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Version 1.4

Abstract

In this note we present the measurement of the single CFT cluster finding efficiency. The latest version of this note can be downloaded from the AFEII web site. It is also available in HTML format at http://plone4.fnal.gov/P1/AFEIIUpgrade/offline/afe_eff/.

Contents

1 AFEII Installation History

During the testing stage the AFEII boards were introduced to the CFT detector in small portions. In Table 1 we give a chronological list of changes affecting the configuration of the CFT readout system as the AFEII boards were inserted or extracted.

Table 1: AFEII installation history.

Date	**AFE Slots**	**First Run**	**Comments**
9 Jun, 2006	+12B4, +12B5, +13A0, +13A1	222025	pre-production boards
21 Jun, 2006	±12B4, ±13A0, +13A4, +13B0	222484	
27 Jun, 2006	±13A4, ±13B0		
13 Jul, 2006	+13A5	223216	
21 Jul, 2006	+13B1, +1B0, +1B1	223431	
3 Aug 06	+11B6, +11B7, +12A0, +12A1	223953	
31 Aug 06	+12A4, +12A5, +12B0, +12B1	224741	
7 Sep 06	+1B4, +1B5	224980	
15 Sep 06	+9A6, +9A7	225294	
17 Sep 06	−9A6, −9A7	225340	
26 Sep 06	−1B0, −1B1	225747	
28 Sep 06	+9A6, +9A7		

Table 2: Analyzed runs summary.

Analyzed Runs	**Date and Time**	**Num. of Events**	$\mathcal{L}$ ($\times 30$)
Comparison of 14 stereo AFEI (run 223008) and AFEII (run 224985) boards			
223008	9 Jul, 2006	427,000	145–120
224985	7 Sep, 2006	284,000	150–135
Comparison of AFEI and AFEII in axial 9A6 and 9A7 run 224985			
225402	19 Sep, 2006	370,000	160–130
225924	1 Oct, 2006	446,000	150–120
First crossing delay change on AFEII boards			
223009	9 Jul, 2006	300,000	110–85
226107	6 Oct, 2006	300,000	110–85

2 Efficiency of Finding a Single Cluster on the Track

The probability of finding a single cluster on the charged particle track is a direct measure of the efficiency of the readout electronics and its setup. In order to measure the efficiency of AFEII boards we select only good tracks which are believed to represent the paths of real particles.

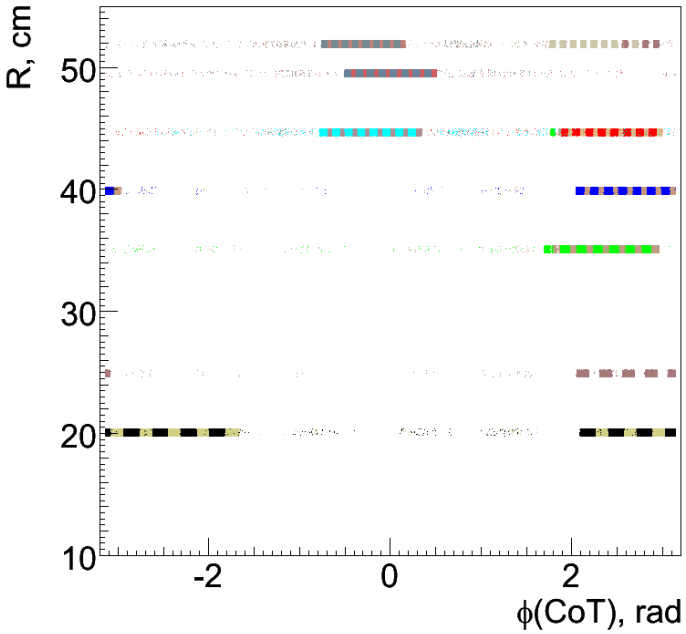
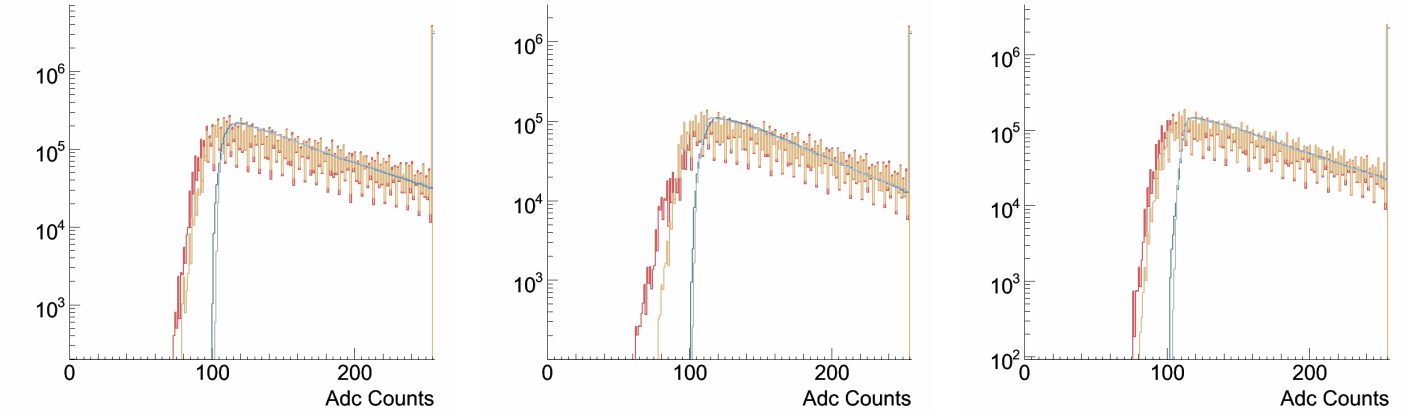


Figure 1: Distribution of clusters on tracks in the R–ϕ view. Only the tracks propogated through at least one of the 14 AFE boards are shown.

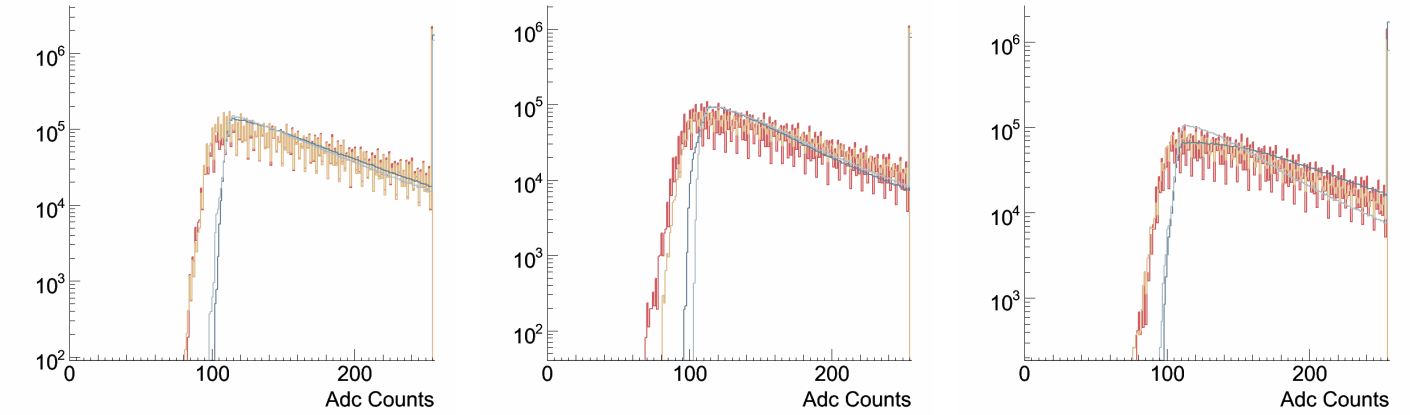
2.1 Stereo Layer Efficiency

We calculate and compare the single cluster efficiencies in two runs 223008 and 224985. In the period between the given runs 14 AFEI boards were replaced by AFEII boards in the following cryostat slots: 1B0, 1B1, 1B4, 1B5, 11B6, 11B7, 12A0, 12A1, 12A4, 12A5, 12B0, 12B1, 13A5, and 13B1.

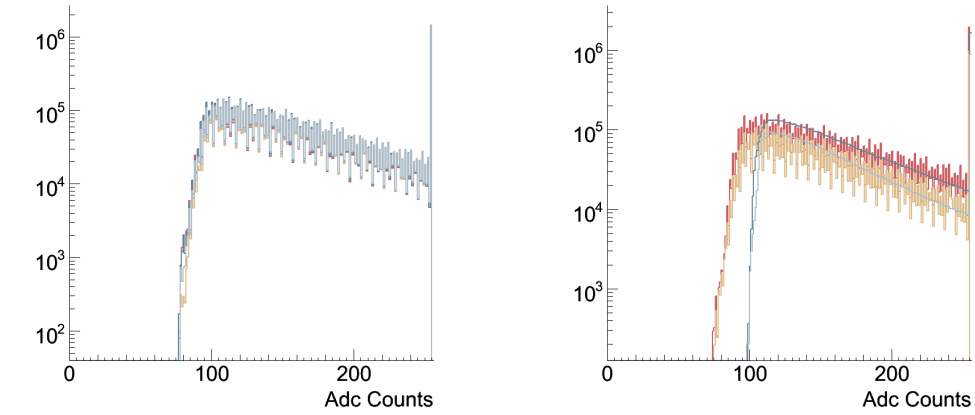
2.1.1 With First Crossing Delay



(a) 11B6 and 11B7. (b) 12A0 and 12A1. (c) 12A4 and 12A5.

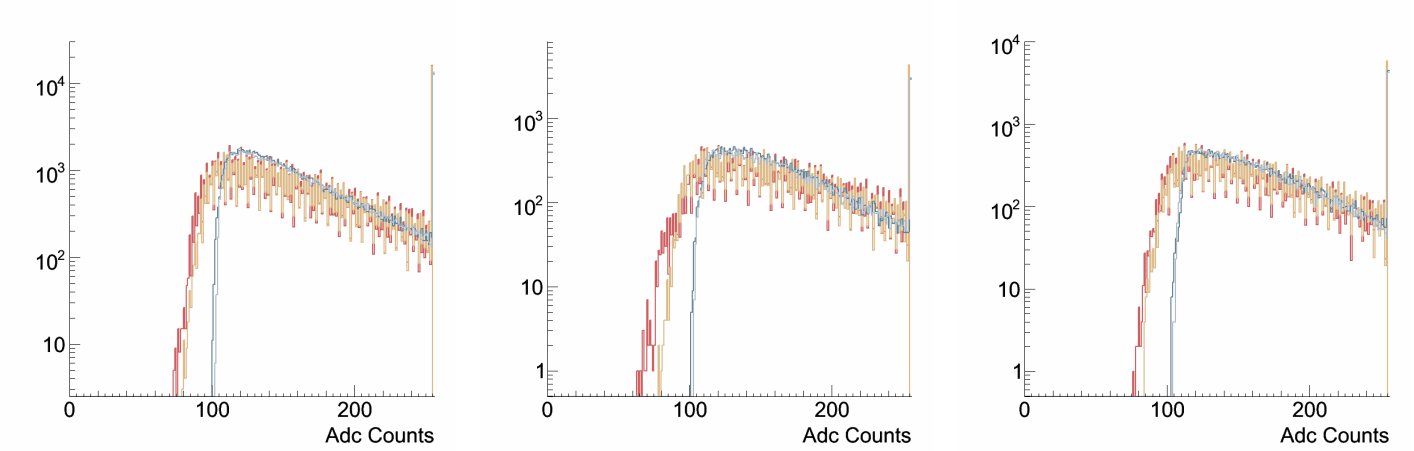


(d) 12B0 and 12B1. (e) 1B0 and 1B1. (f) 1B4 and 1B5.

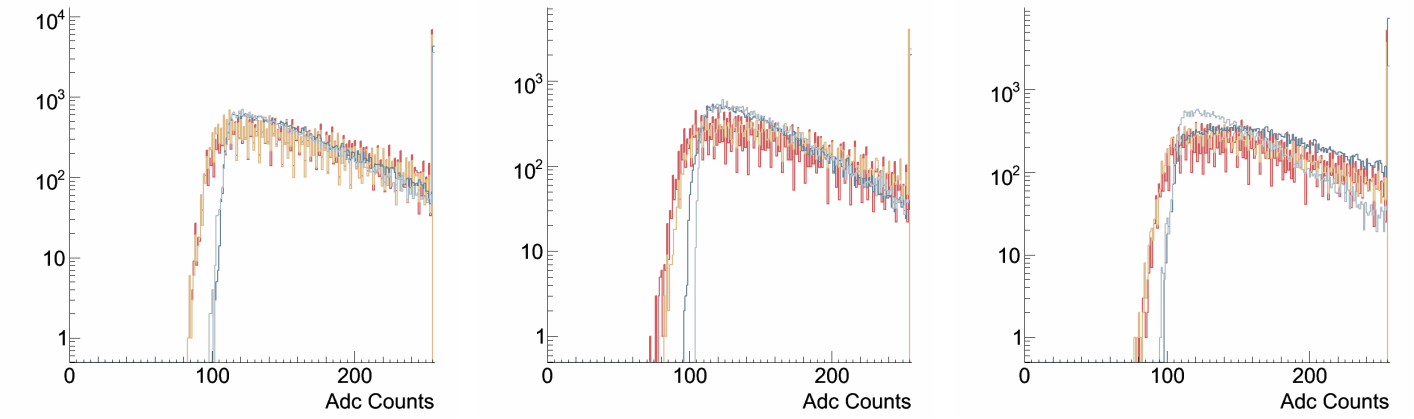


(g) 2B0 and 2B1. (h) 13A5 and 13B1.

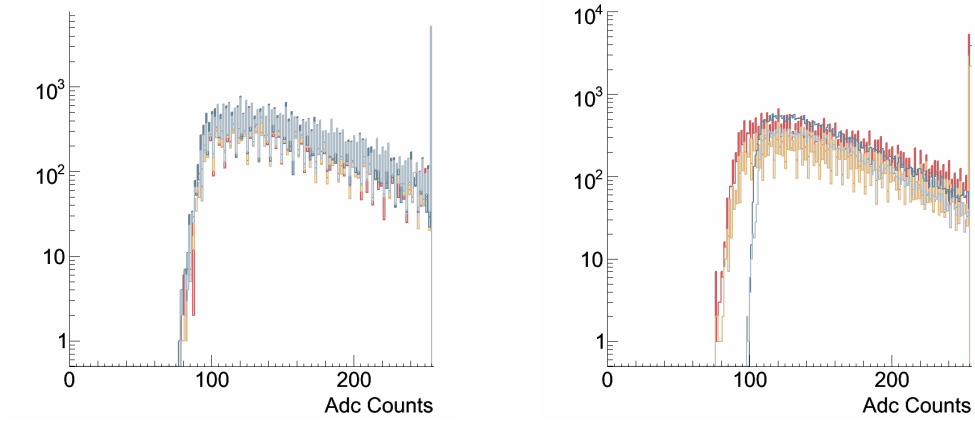
Figure 2: Integral ADC output distributions for all channels in all clusters. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



(a) 11B6 and 11B7. (b) 12A0 and 12A1. (c) 12A4 and 12A5.

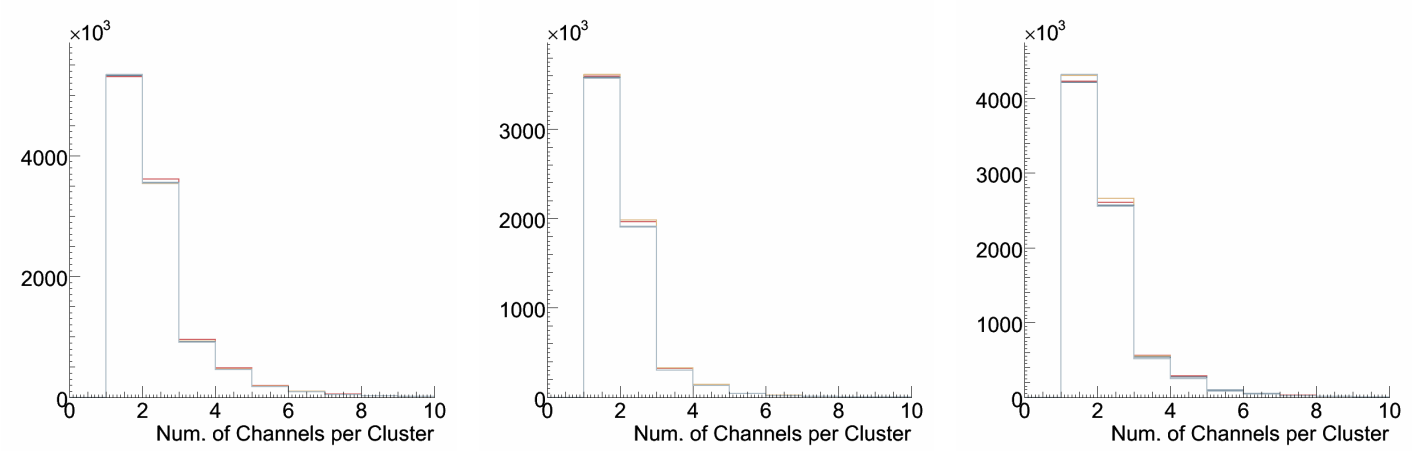


(d) 12B0 and 12B1. (e) 1B0 and 1B1. (f) 1B4 and 1B5.

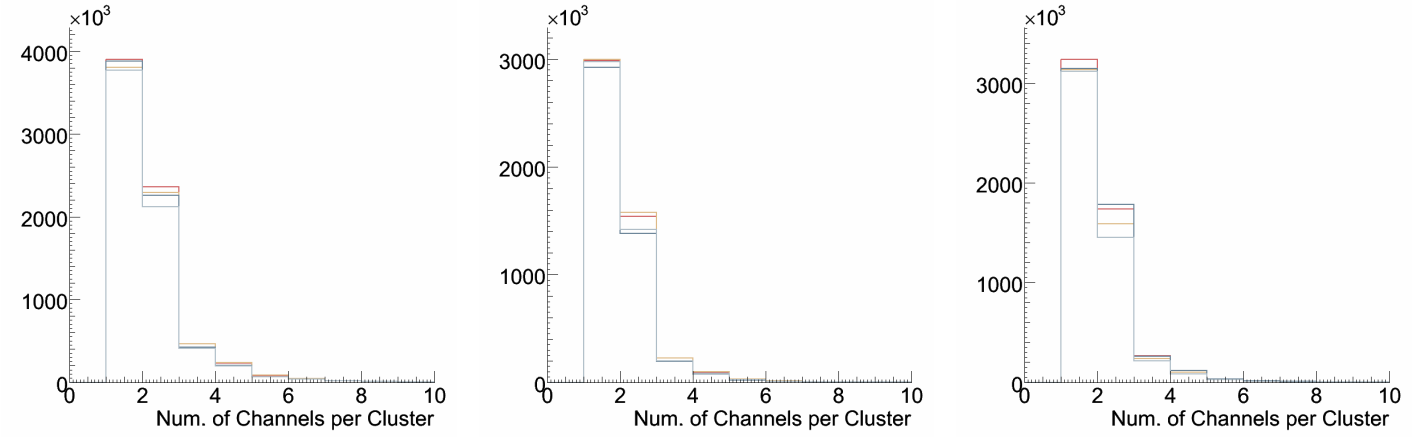


(g) 2B0 and 2B1. (h) 13A5 and 13B1.

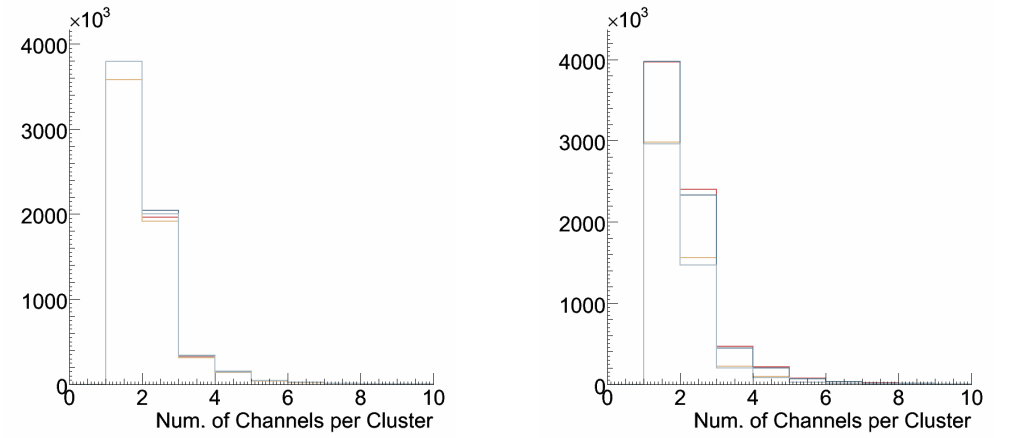
Figure 3: Integral ADC output distribution only for the channels that form a cluster associated with a track. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



(a) 11B6 and 11B7. (b) 12A0 and 12A1. (c) 12A4 and 12A5.

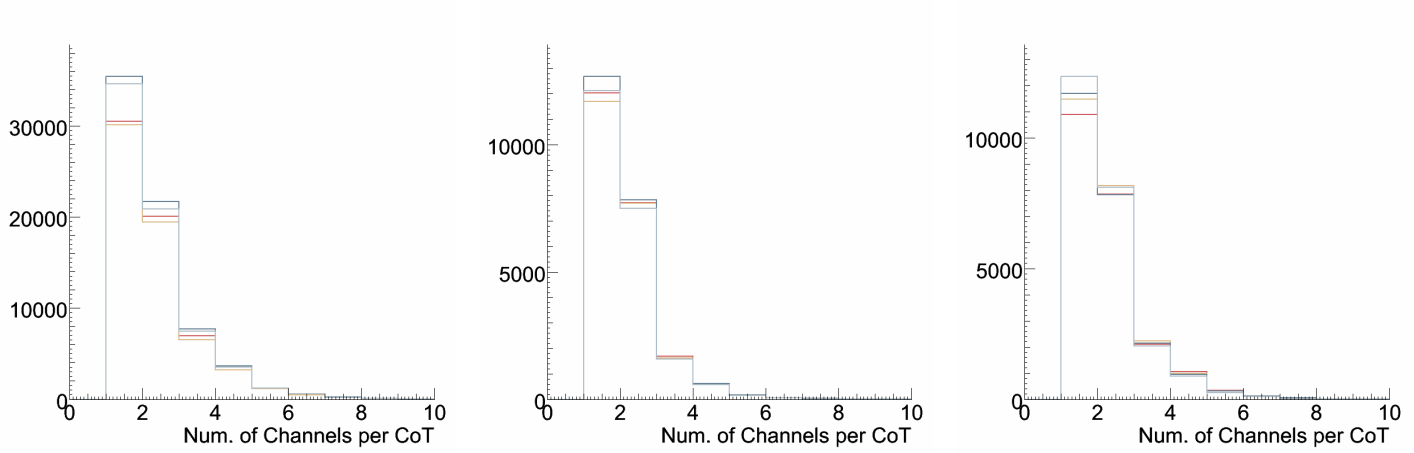


(d) 12B0 and 12B1. (e) 1B0 and 1B1. (f) 1B4 and 1B5.



(g) 2B0 and 2B1. (h) 13A5 and 13B1.

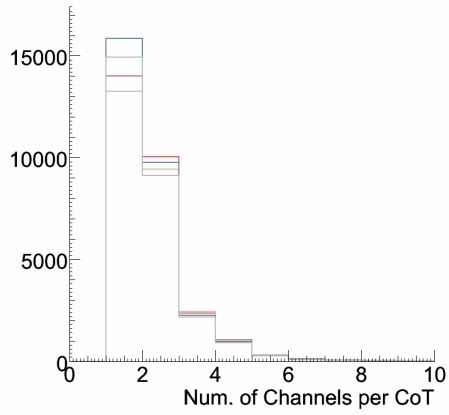
Figure 4: Number of channels per cluster, *i.e.* cluster's size. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



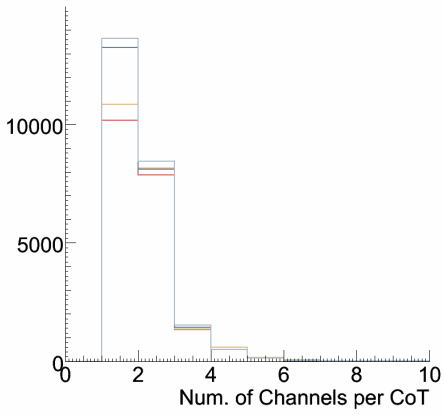
(a) 11B6 and 11B7.

(b) 12A0 and 12A1.

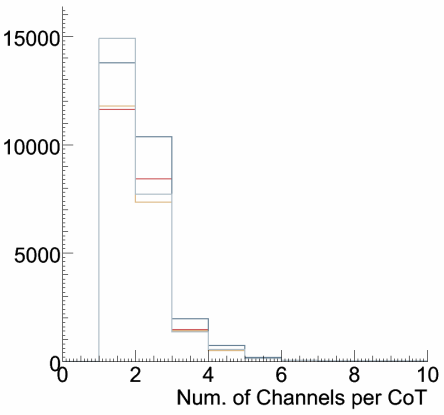
(c) 12A4 and 12A5.



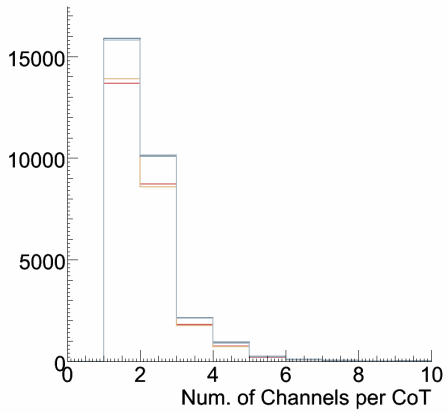
(d) 12B0 and 12B1.



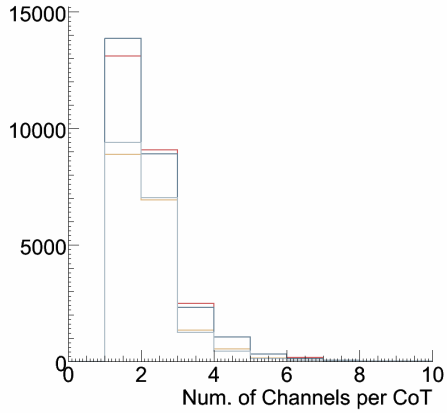
(e) 1B0 and 1B1.



(f) 1B4 and 1B5.

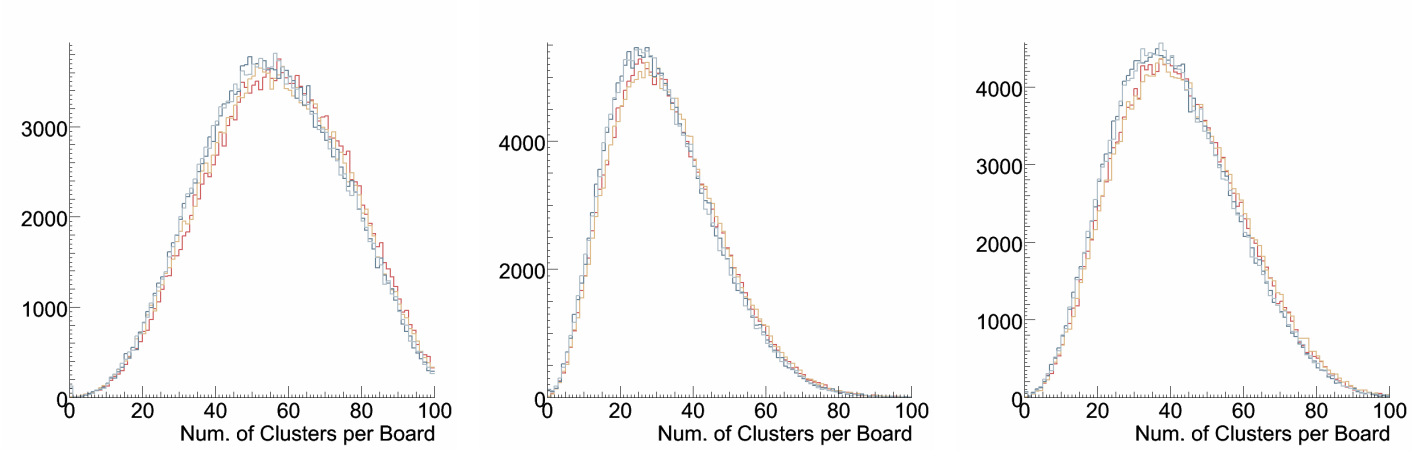


(g) 2B0 and 2B1.

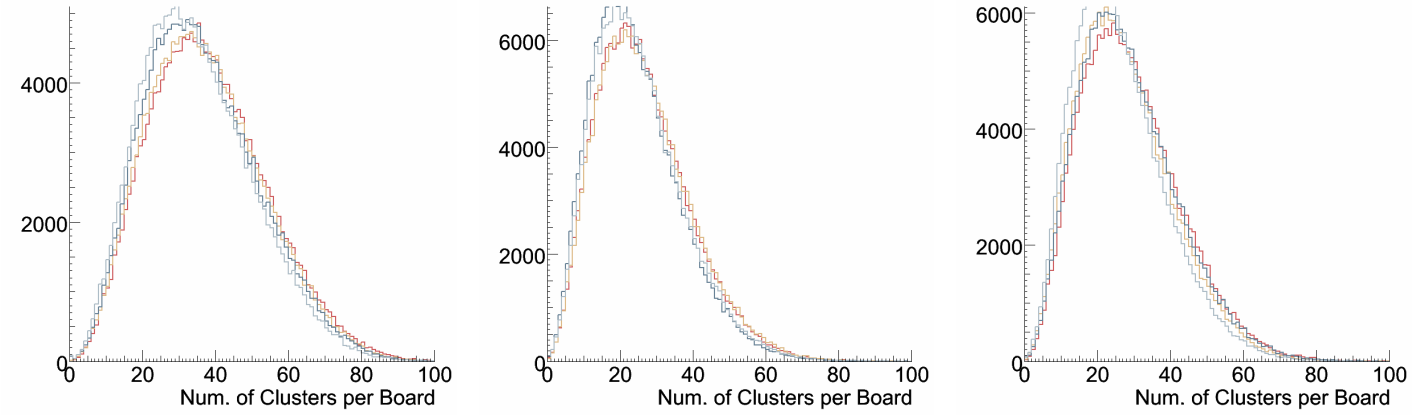


(h) 13A5 and 13B1.

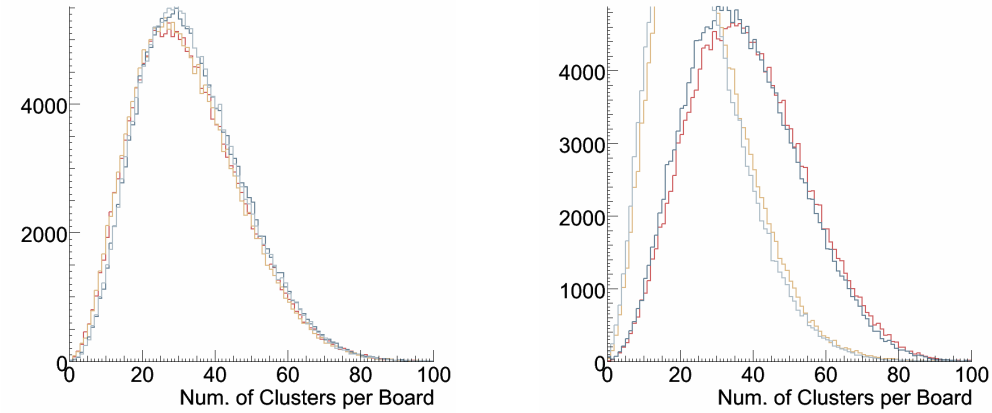
Figure 5: Number of channels per cluster associated with a track. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



(a) 11B6 and 11B7. (b) 12A0 and 12A1. (c) 12A4 and 12A5.

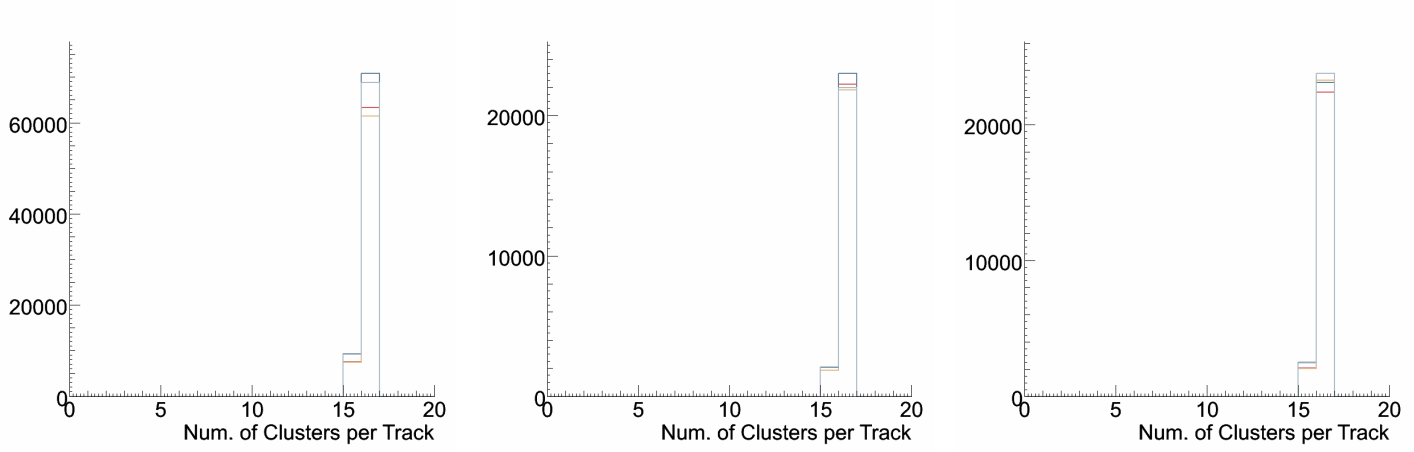


(d) 12B0 and 12B1. (e) 1B0 and 1B1. (f) 1B4 and 1B5.



(g) 2B0 and 2B1. (h) 13A5 and 13B1.

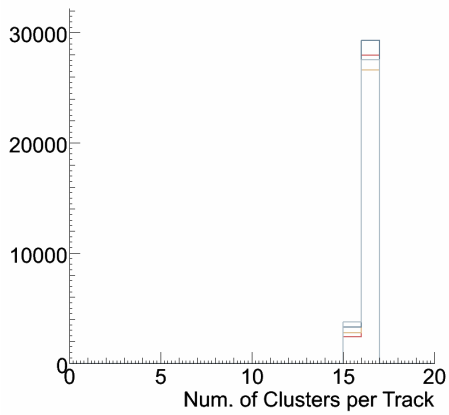
Figure 6: Number of clusters per board. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



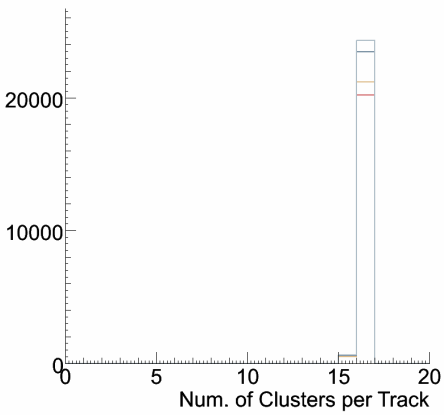
(a) 11B6 and 11B7.

(b) 12A0 and 12A1.

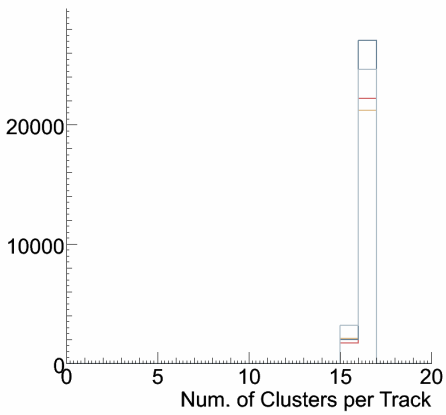
(c) 12A4 and 12A5.



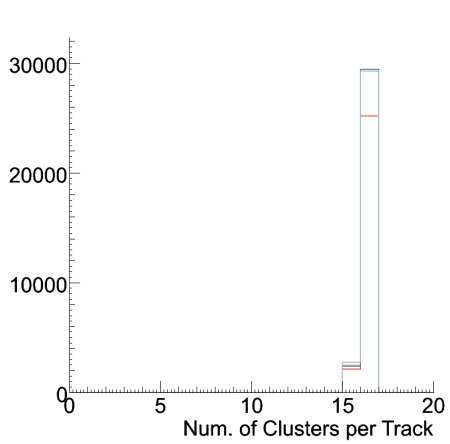
(d) 12B0 and 12B1.



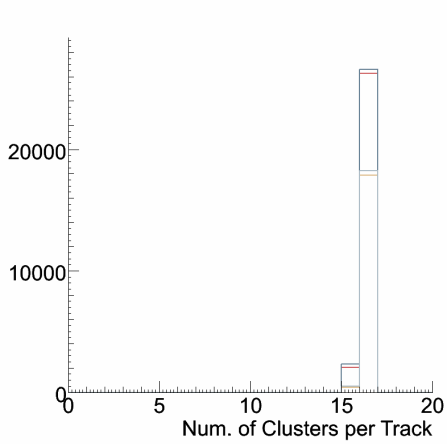
(e) 1B0 and 1B1.



(f) 1B4 and 1B5.

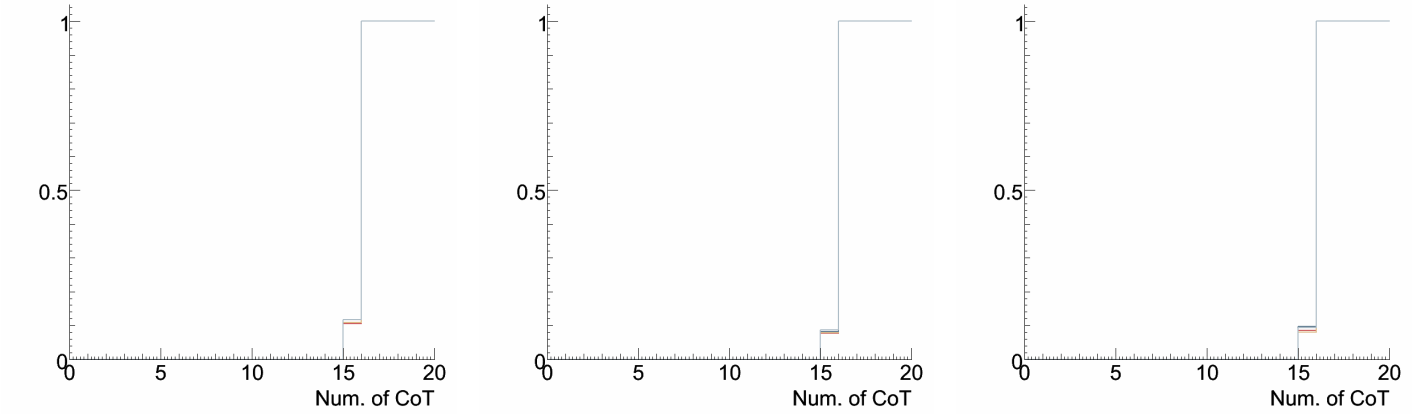


(g) 2B0 and 2B1.

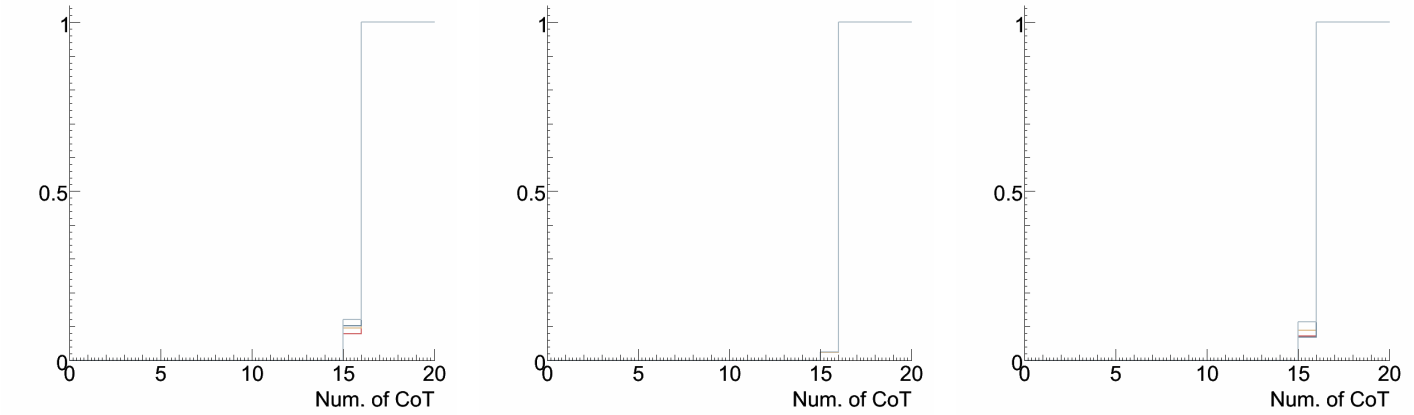


(h) 13A5 and 13B1.

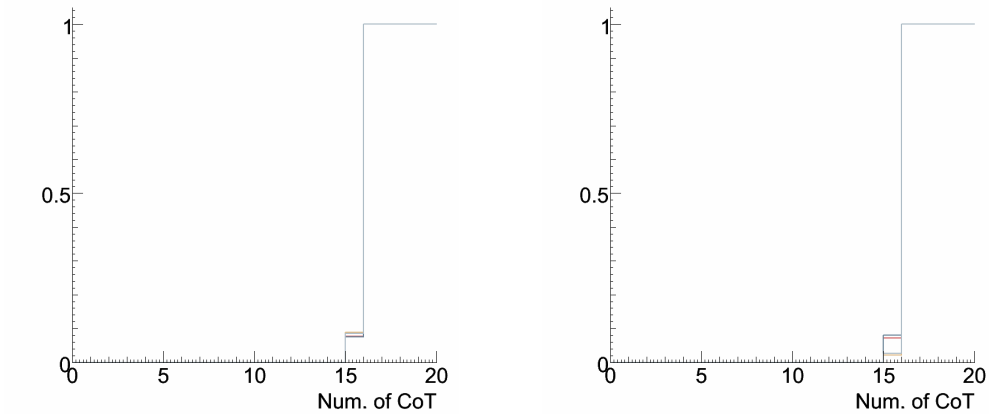
Figure 7: Number of clusters per track. Note that we select tracks with 15 or 16 clusters on them with a possibly missing cluster from the board in question. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



(a) 11B6 and 11B7. (b) 12A0 and 12A1. (c) 12A4 and 12A5.

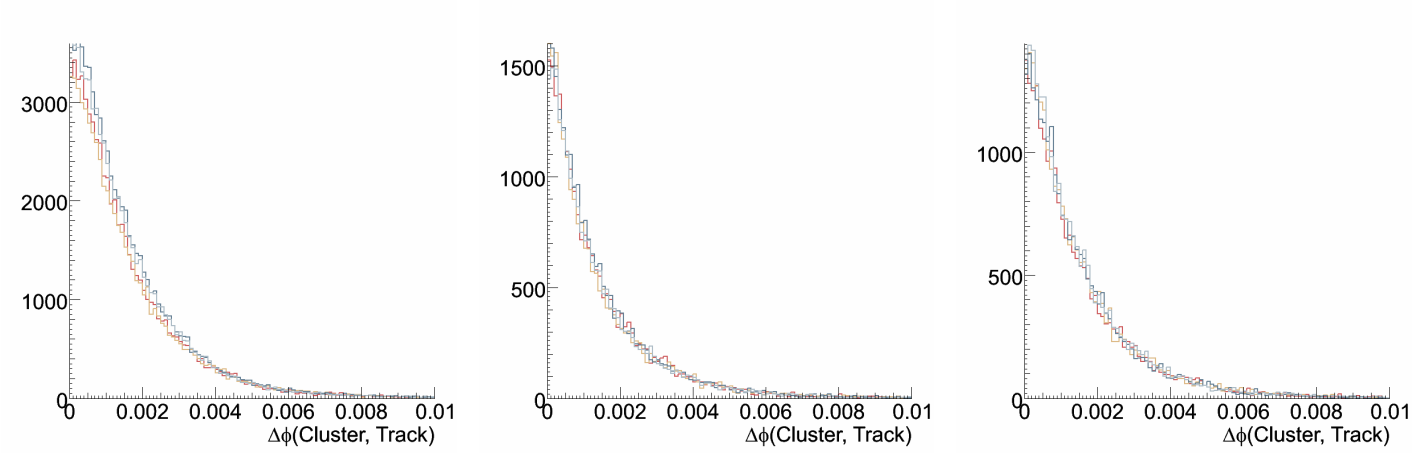


(d) 12B0 and 12B1. (e) 1B0 and 1B1. (f) 1B4 and 1B5.



(g) 2B0 and 2B1. (h) 13A5 and 13B1.

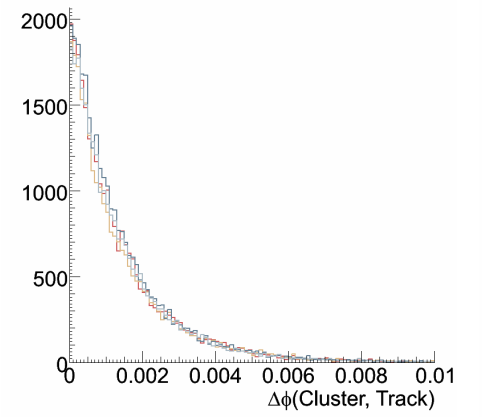
Figure 8: Cumulative distribution of the number of clusters per track (see Figure 32). The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



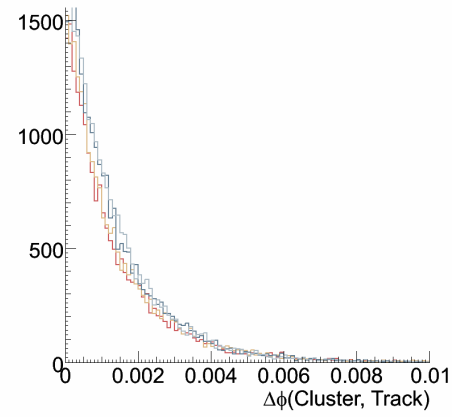
(a) 11B6 and 11B7.

(b) 12A0 and 12A1.

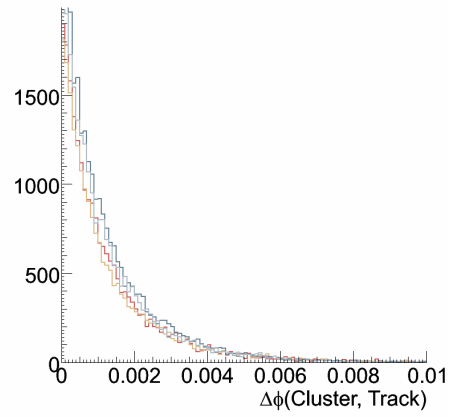
(c) 12A4 and 12A5.



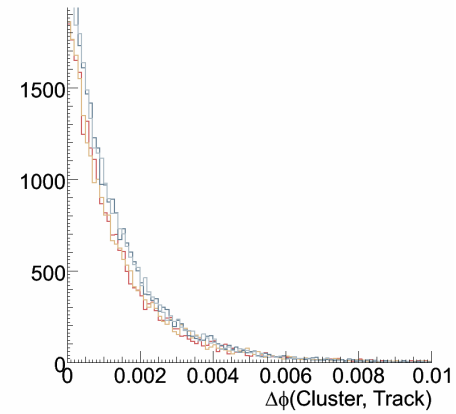
(d) 12B0 and 12B1.



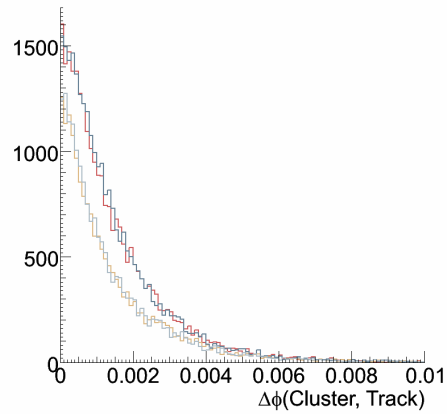
(e) 1B0 and 1B1.



(f) 1B4 and 1B5.

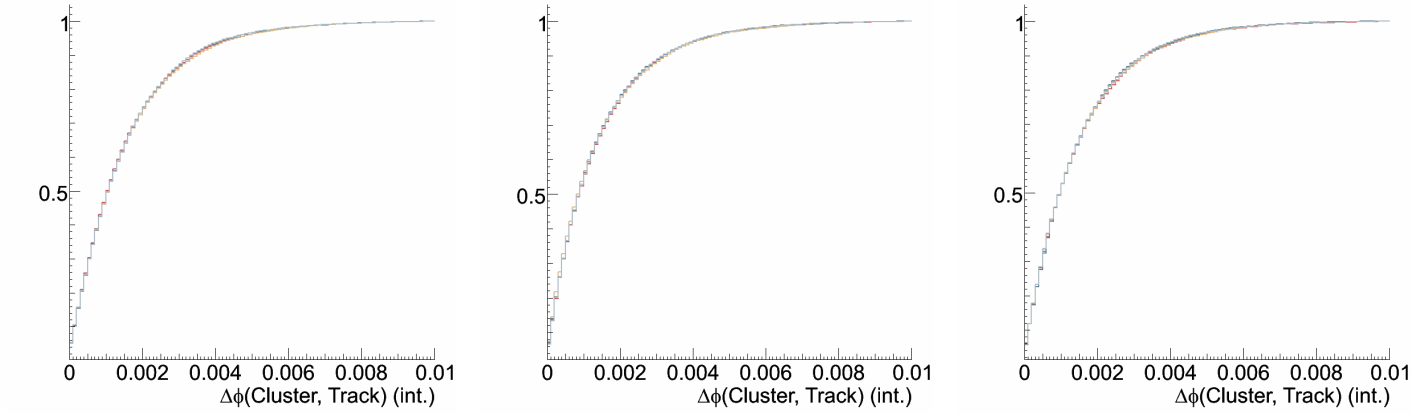


(g) 2B0 and 2B1.

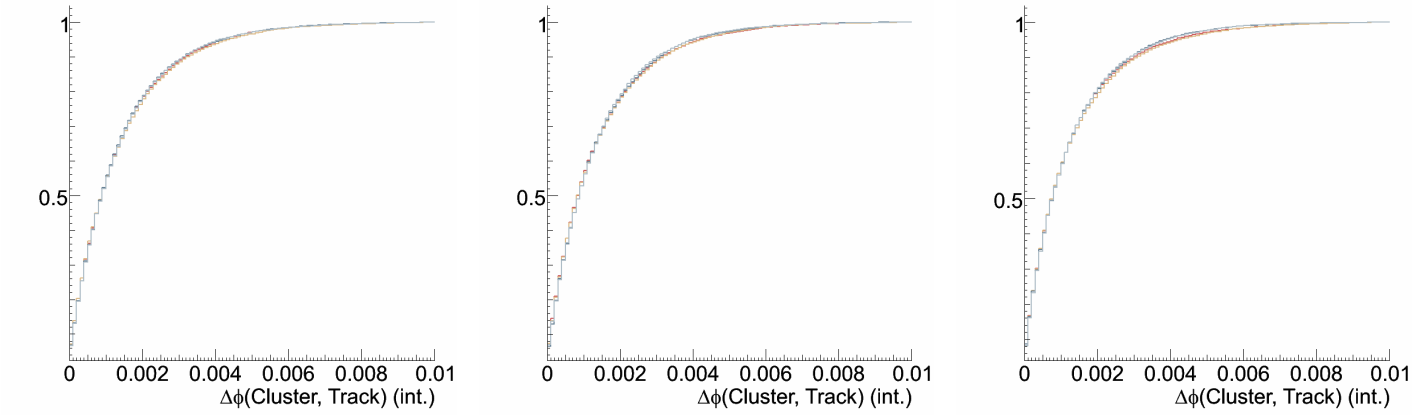


(h) 13A5 and 13B1.

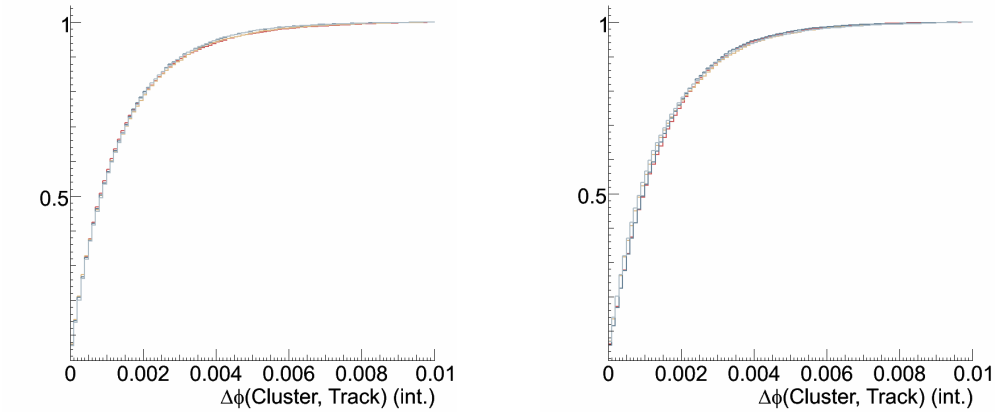
Figure 9: Distance in radians from the track to the cluster associated with that track. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



(a) 11B6 and 11B7. (b) 12A0 and 12A1. (c) 12A4 and 12A5.

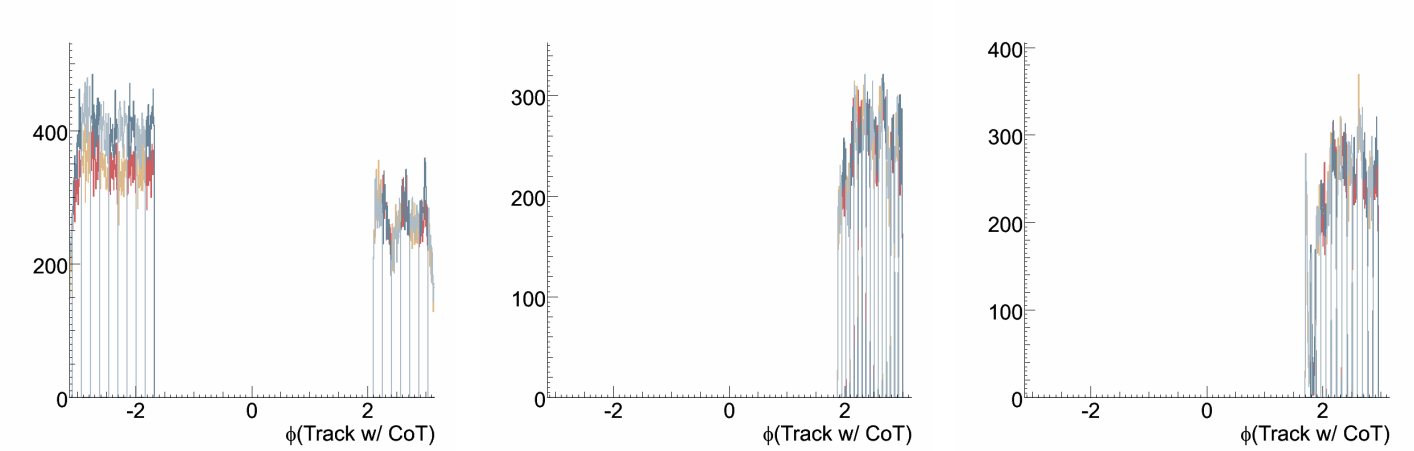


(d) 12B0 and 12B1. (e) 1B0 and 1B1. (f) 1B4 and 1B5.



(g) 2B0 and 2B1. (h) 13A5 and 13B1.

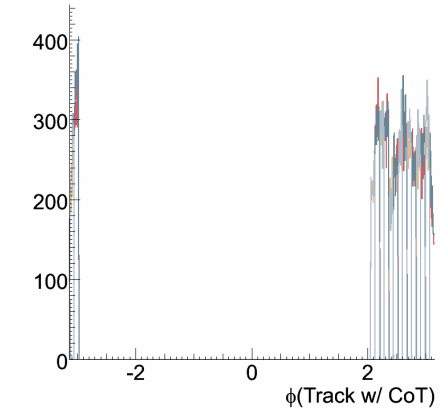
Figure 10: Cumulative distribution of the distance from the track to the cluster associated with that track (see Figure **??**). The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



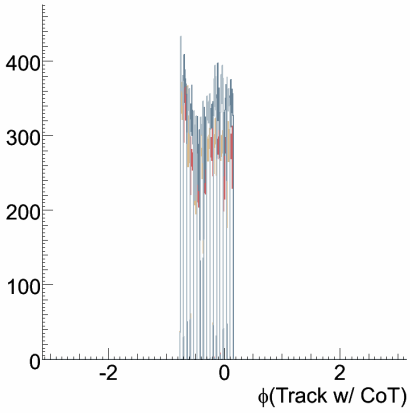
(a) 11B6 and 11B7.

(b) 12A0 and 12A1.

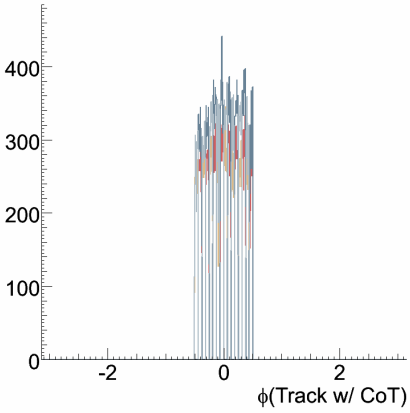
(c) 12A4 and 12A5.



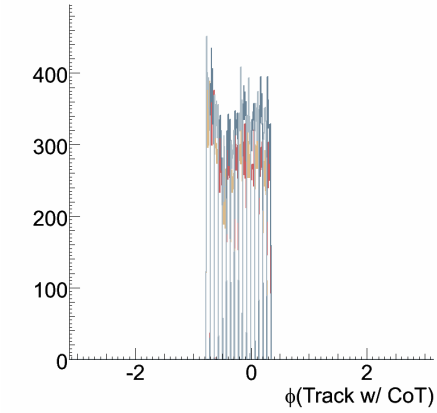
(d) 12B0 and 12B1.



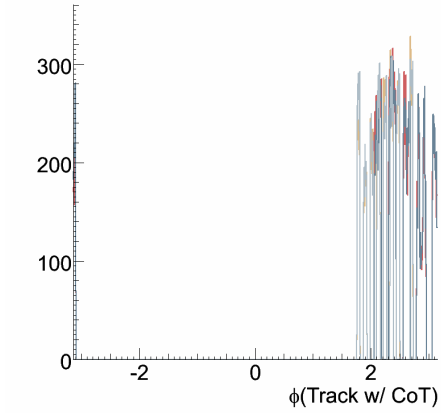
(e) 1B0 and 1B1.



(f) 1B4 and 1B5.

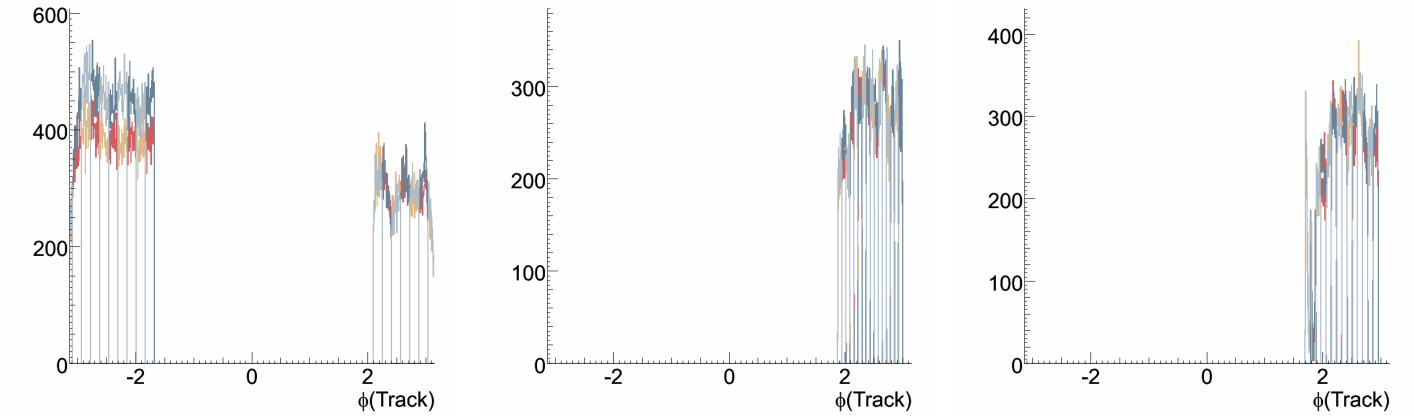


(g) 2B0 and 2B1.



(h) 13A5 and 13B1.

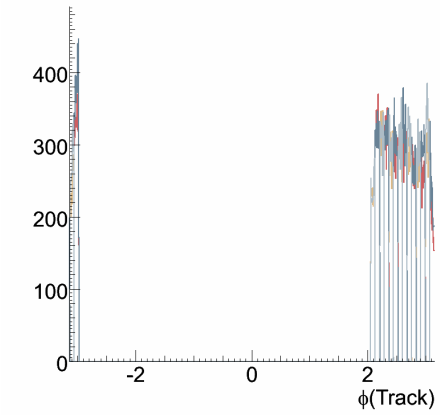
Figure 11: Number of tracks with 16 clusters as a function of ϕ angle. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



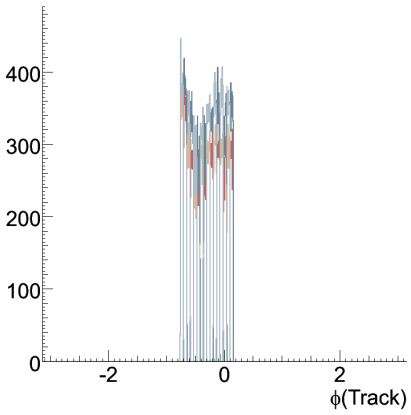
(a) 11B6 and 11B7.

(b) 12A0 and 12A1.

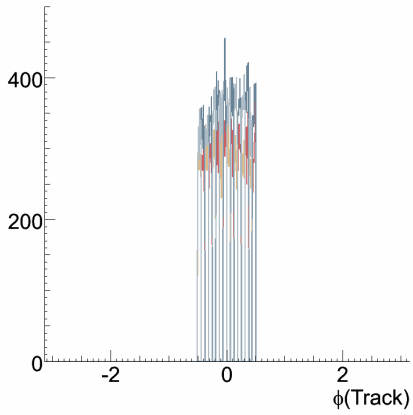
(c) 12A4 and 12A5.



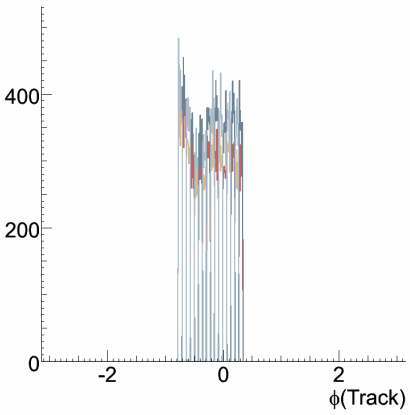
(d) 12B0 and 12B1.



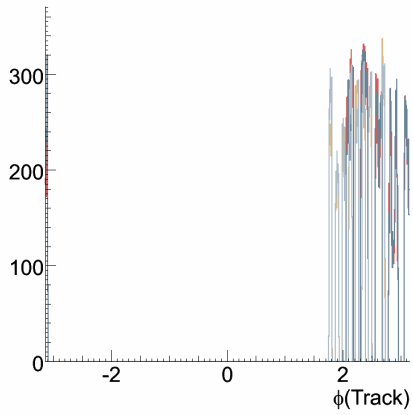
(e) 1B0 and 1B1.



(f) 1B4 and 1B5.

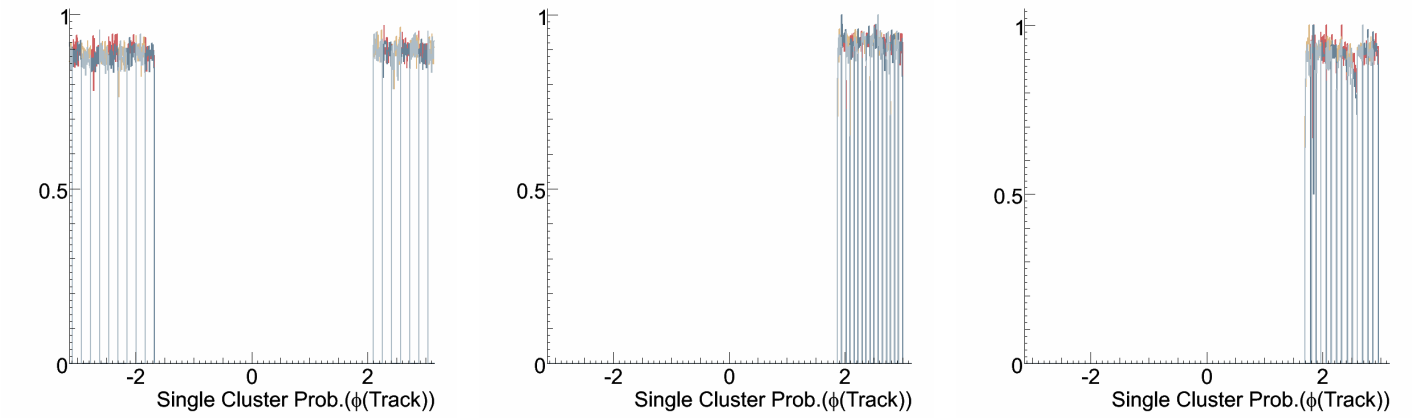


(g) 2B0 and 2B1.

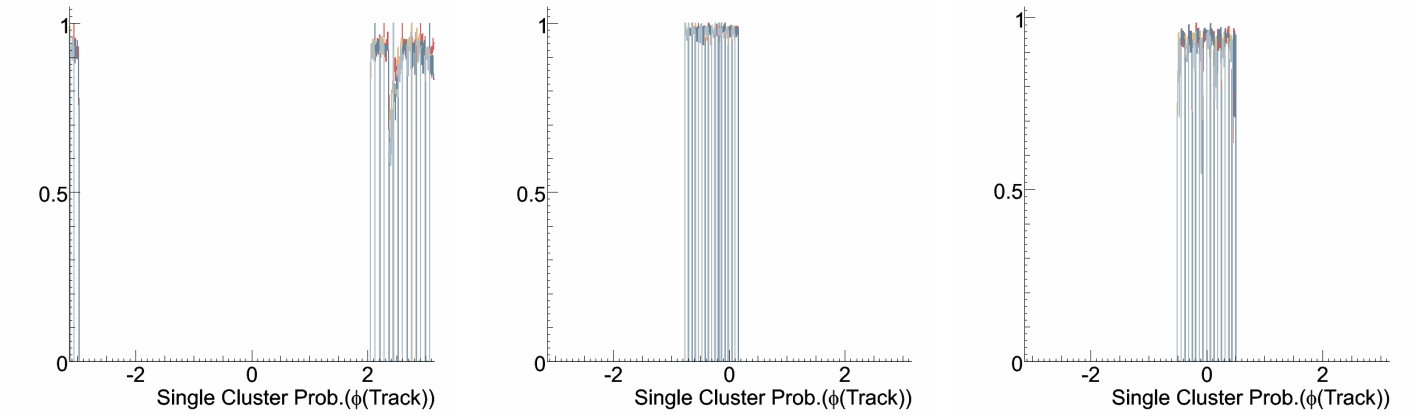


(h) 13A5 and 13B1.

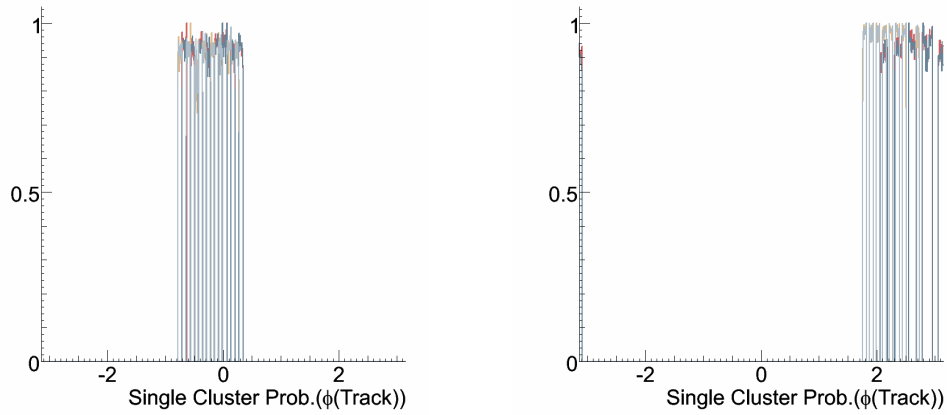
Figure 12: Total number of tracks as a function of ϕ angle. The track may or may not have a cluster in the layer associated with the AFE board. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



(a) 11B6 and 11B7. (b) 12A0 and 12A1. (c) 12A4 and 12A5.

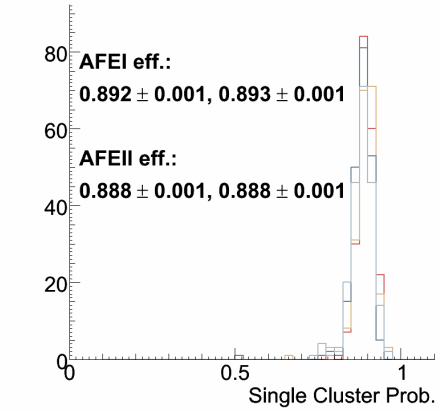


(d) 12B0 and 12B1. (e) 1B0 and 1B1. (f) 1B4 and 1B5.

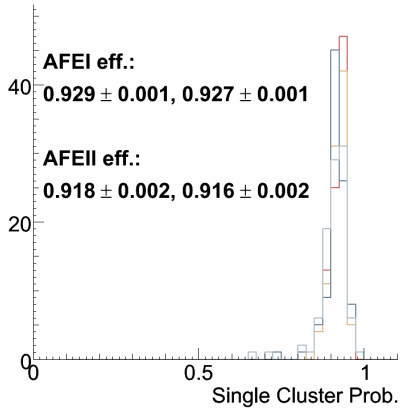


(g) 2B0 and 2B1. (h) 13A5 and 13B1.

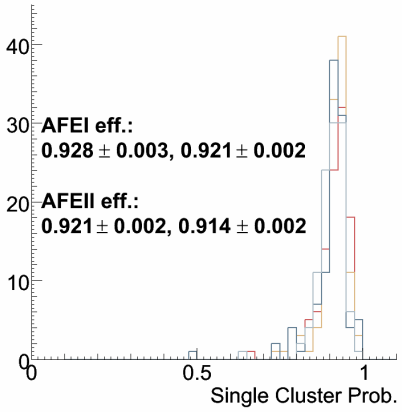
Figure 13: Probability of finding a cluster on the track in the layer read out by the AFE board as a function of ϕ. These histograms represent the result of division of histograms in Figure 36 by the corresponding histograms in Figure 37. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



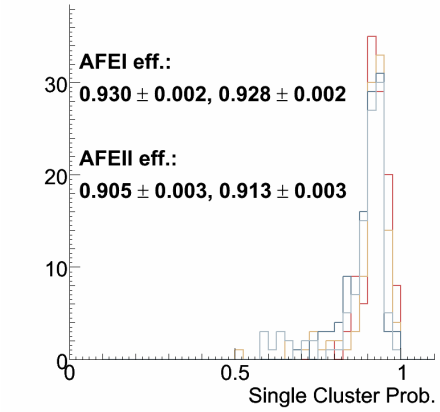
(a) 11B6 and 11B7.



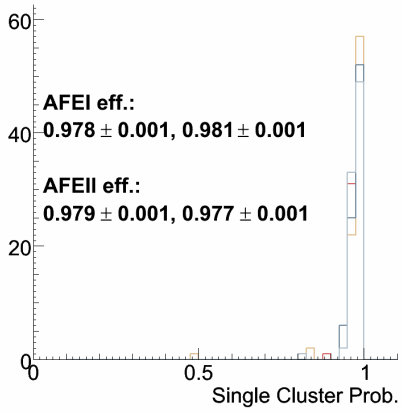
(b) 12A0 and 12A1.



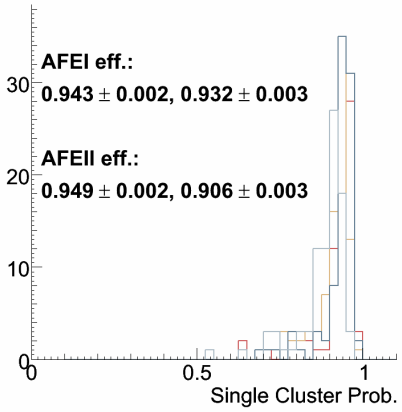
(c) 12A4 and 12A5.



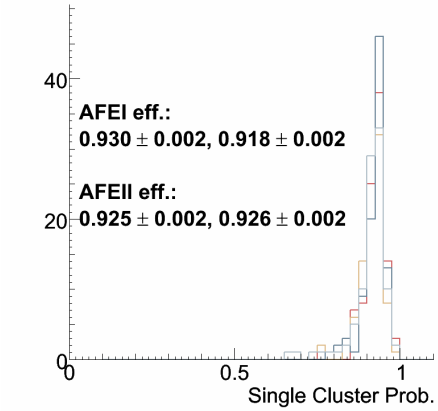
(d) 12B0 and 12B1.



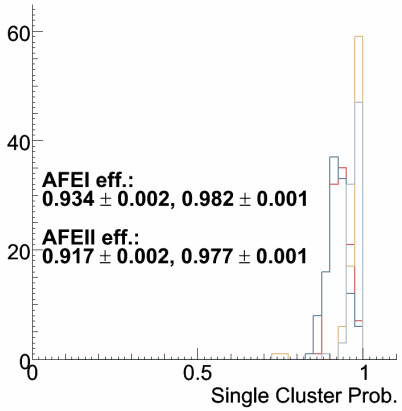
(e) 1B0 and 1B1.



(f) 1B4 and 1B5.

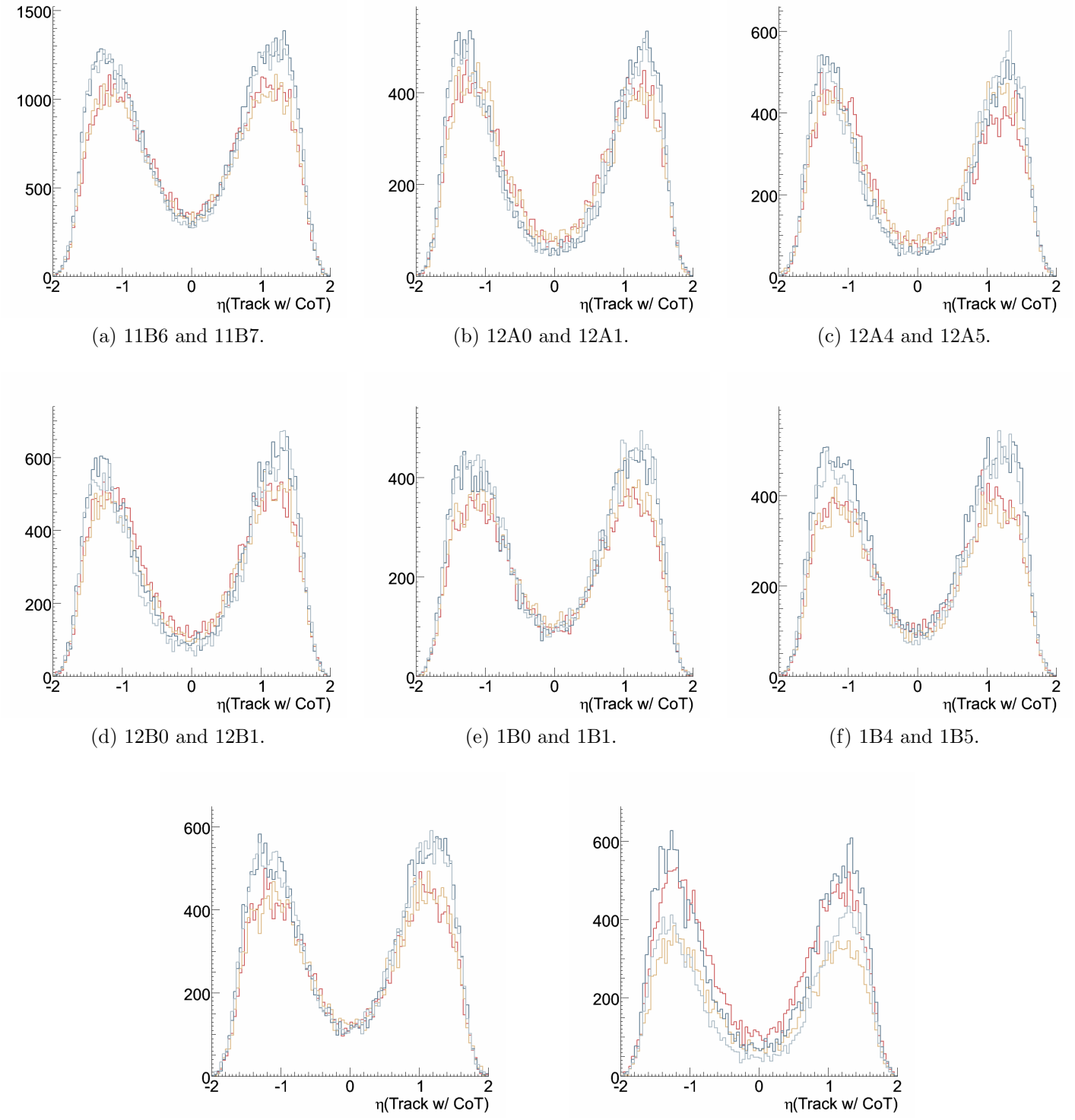


(g) 2B0 and 2B1.



(h) 13A5 and 13B1.

Figure 14: Probability of finding a cluster on the track in the layer read out by the AFE board. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.

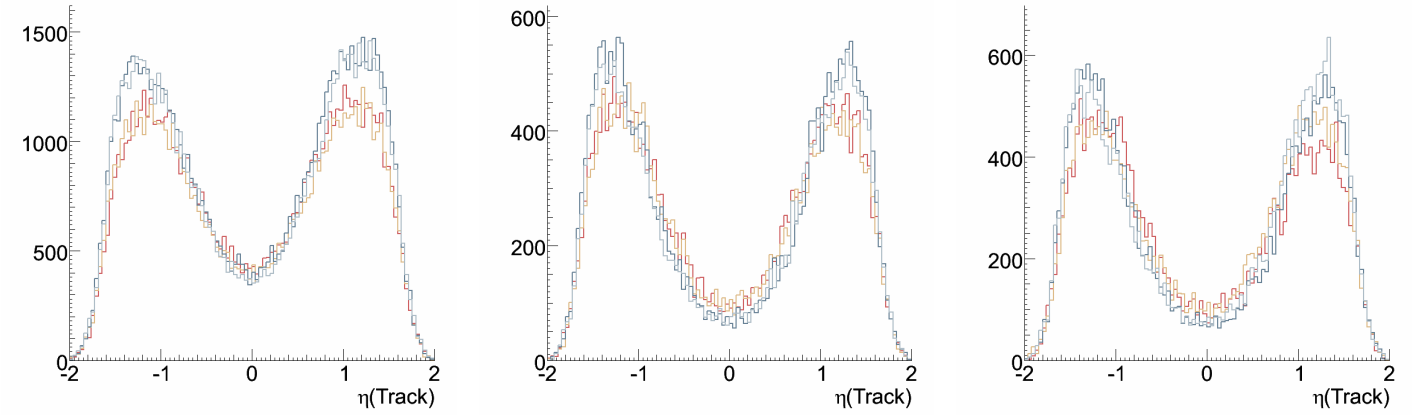


(a) 11B6 and 11B7. (b) 12A0 and 12A1. (c) 12A4 and 12A5.

(d) 12B0 and 12B1. (e) 1B0 and 1B1. (f) 1B4 and 1B5.

(g) 2B0 and 2B1. (h) 13A5 and 13B1.

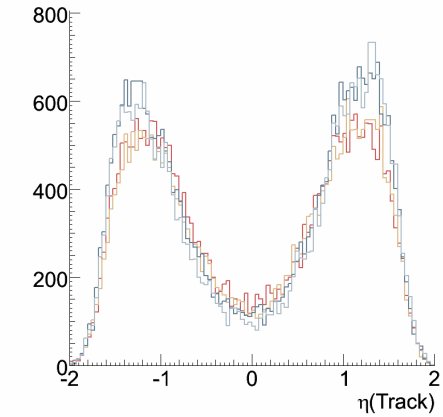
Figure 15: Number of tracks with 16 clusters as a function of η angle. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



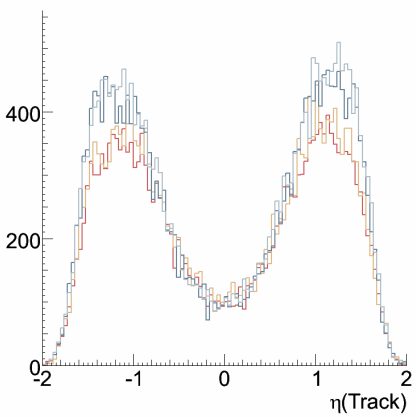
(a) 11B6 and 11B7.

(b) 12A0 and 12A1.

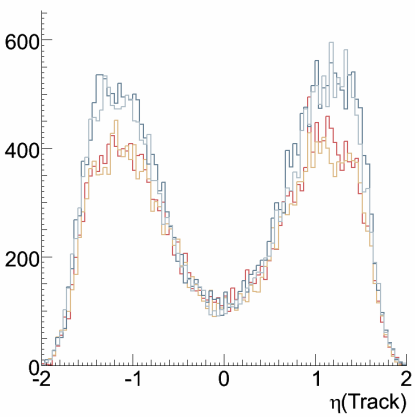
(c) 12A4 and 12A5.



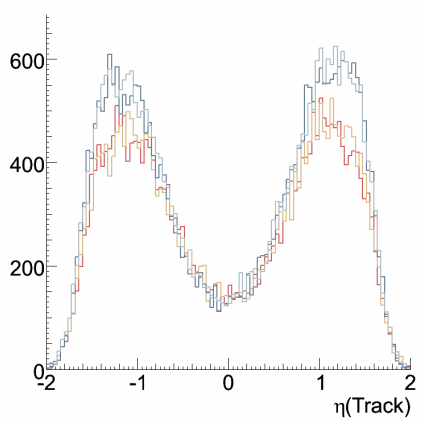
(d) 12B0 and 12B1.



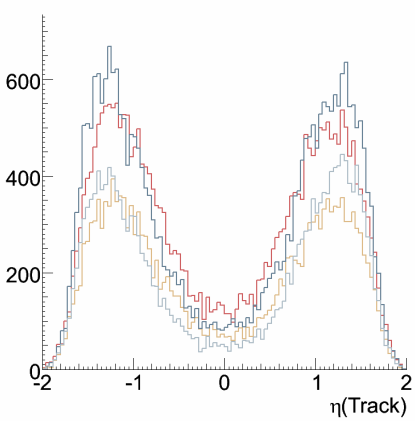
(e) 1B0 and 1B1.



(f) 1B4 and 1B5.

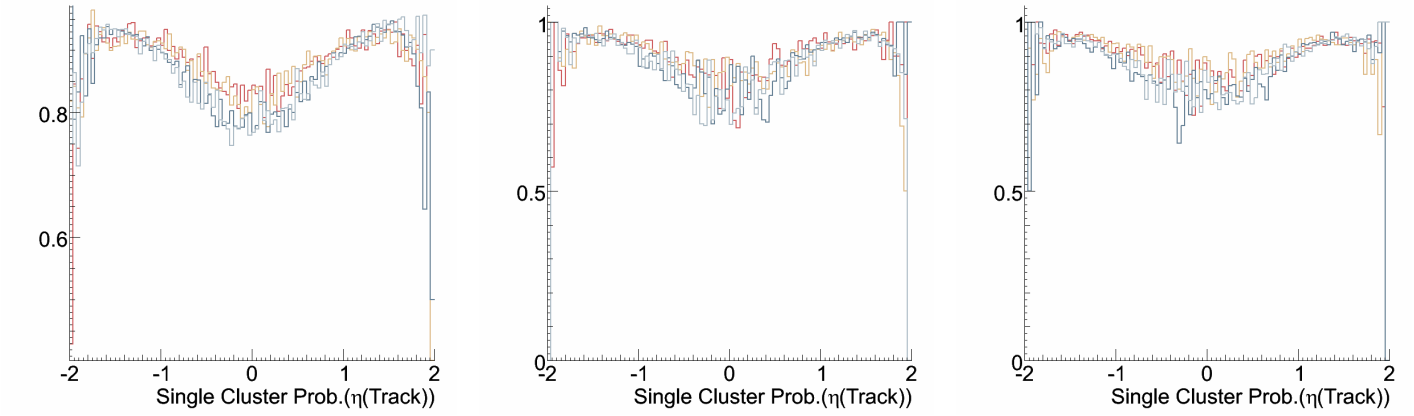


(g) 2B0 and 2B1.



(h) 13A5 and 13B1.

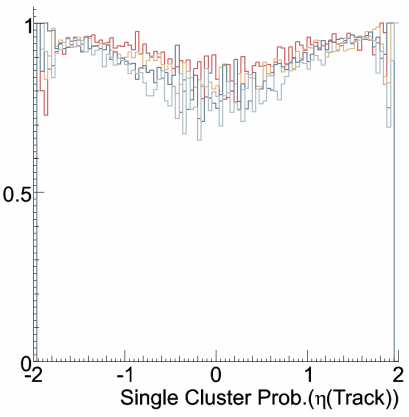
Figure 16: Total number of tracks as a function of η. The track may or may not have a cluster in the layer read out by the AFE board. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



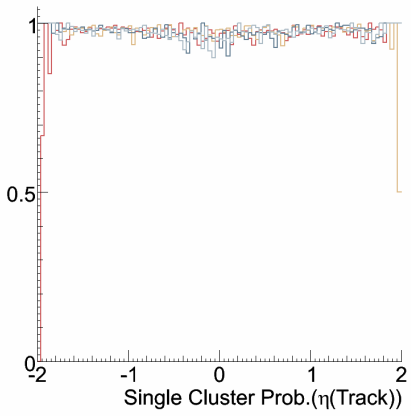
(a) 11B6 and 11B7.

(b) 12A0 and 12A1.

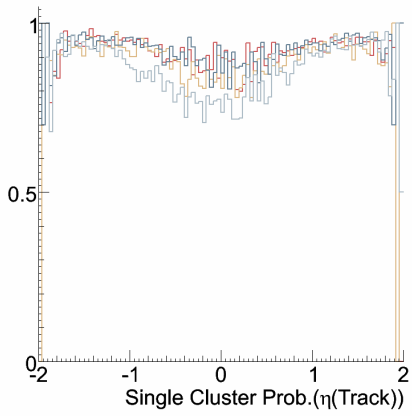
(c) 12A4 and 12A5.



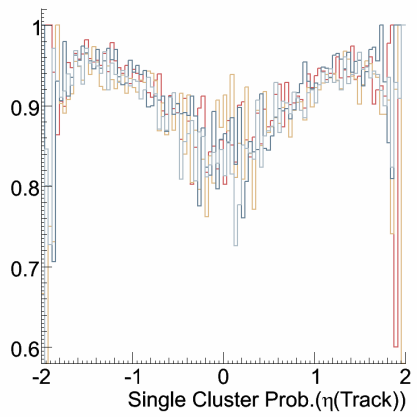
(d) 12B0 and 12B1.



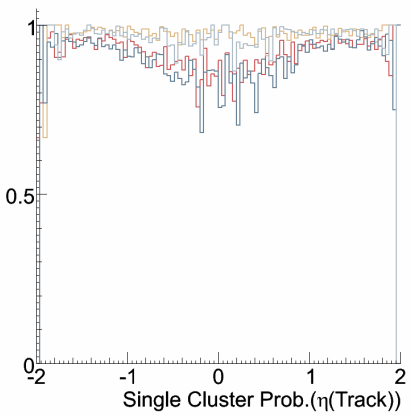
(e) 1B0 and 1B1.



(f) 1B4 and 1B5.

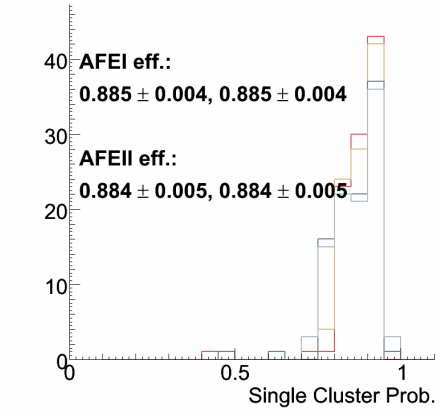


(g) 2B0 and 2B1.

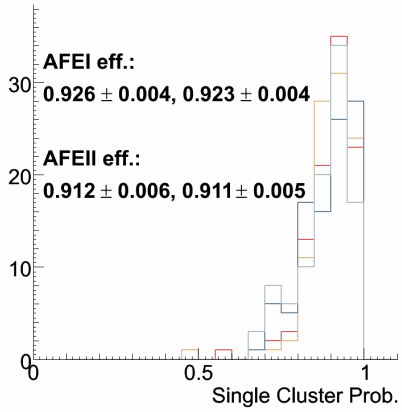


(h) 13A5 and 13B1.

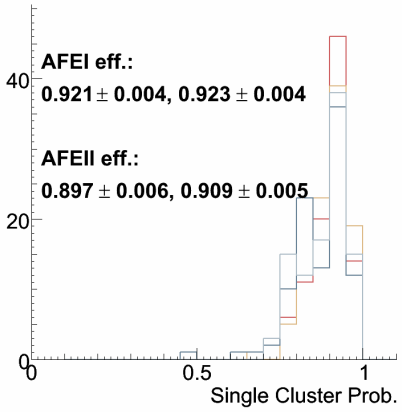
Figure 17: Probability of finding a cluster on the track in the layer read out by the AFE board as a function of η. These histograms represent the result of division of histograms in Figure 40 by the corresponding histograms in Figure 41. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



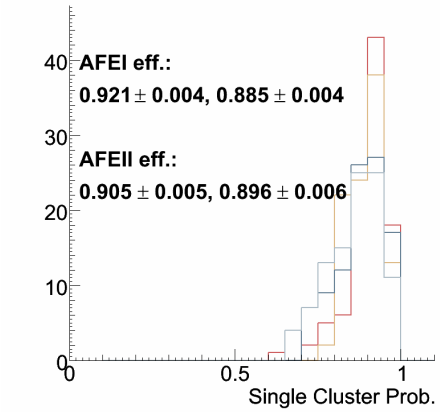
(a) 11B6 and 11B7.



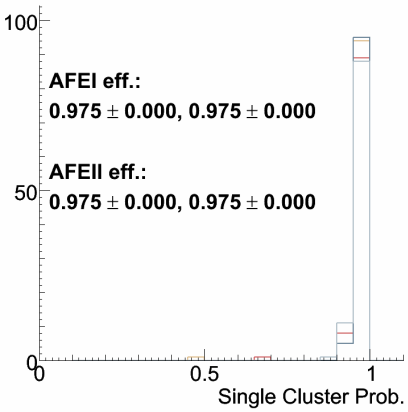
(b) 12A0 and 12A1.



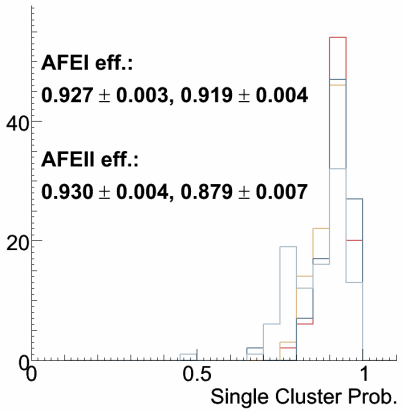
(c) 12A4 and 12A5.



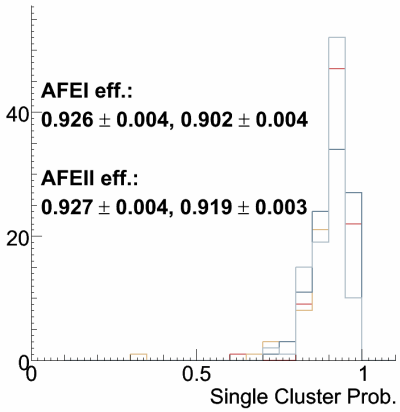
(d) 12B0 and 12B1.



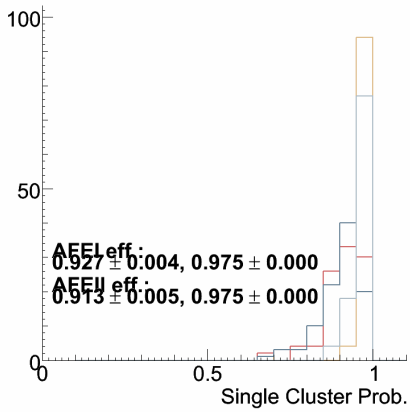
(e) 1B0 and 1B1.



(f) 1B4 and 1B5.



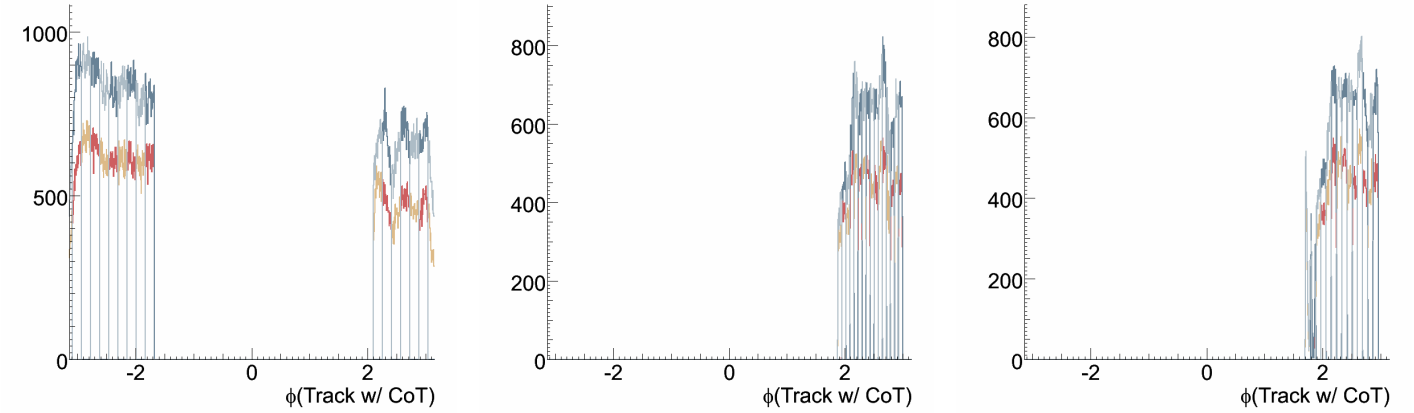
(g) 2B0 and 2B1.



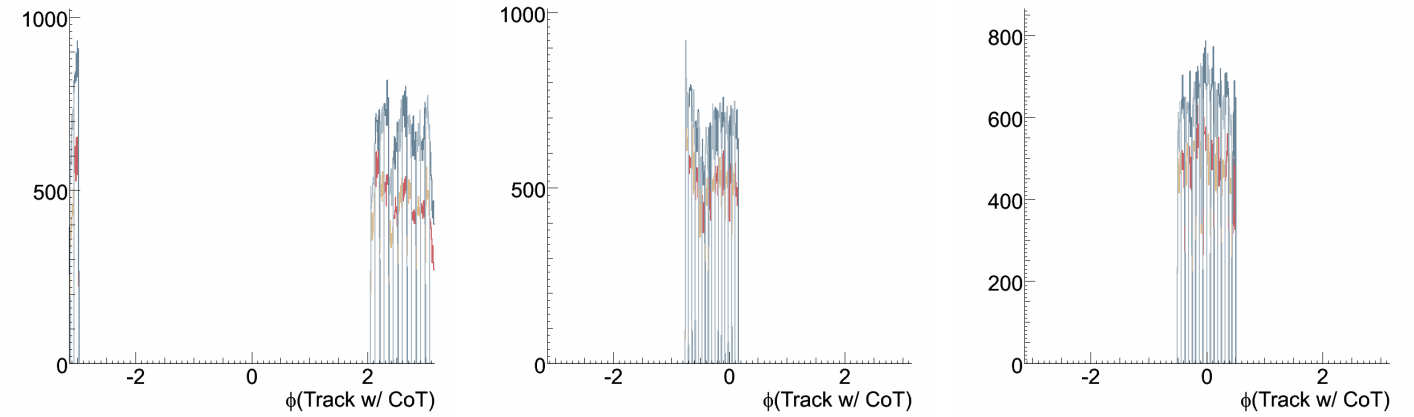
(h) 13A5 and 13B1.

Figure 18: Probability of finding a cluster on the track in the layer read out by the AFE board. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.

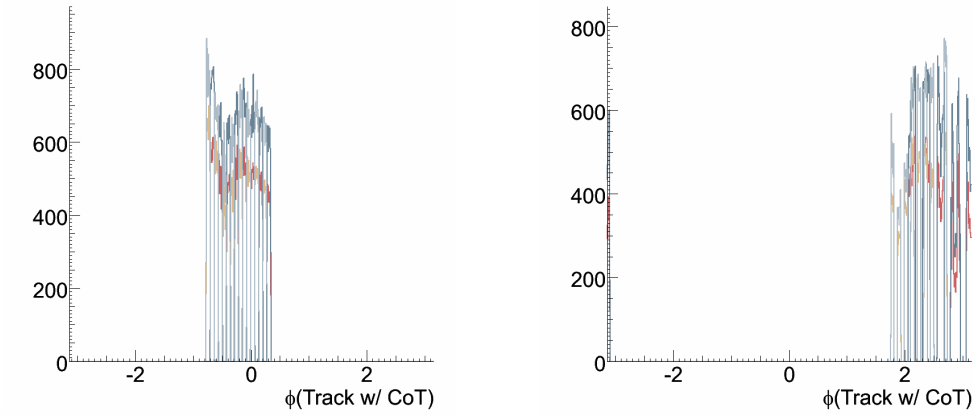
2.1.2 Without First Crossing Delay



(a) 11B6 and 11B7. (b) 12A0 and 12A1. (c) 12A4 and 12A5.

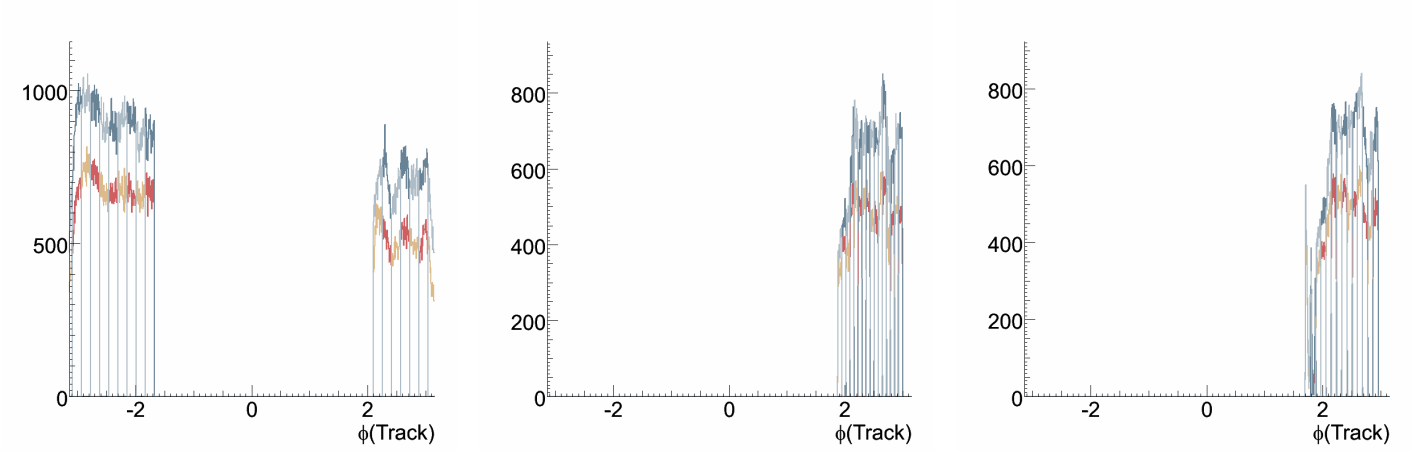


(d) 12B0 and 12B1. (e) 1B0 and 1B1. (f) 1B4 and 1B5.

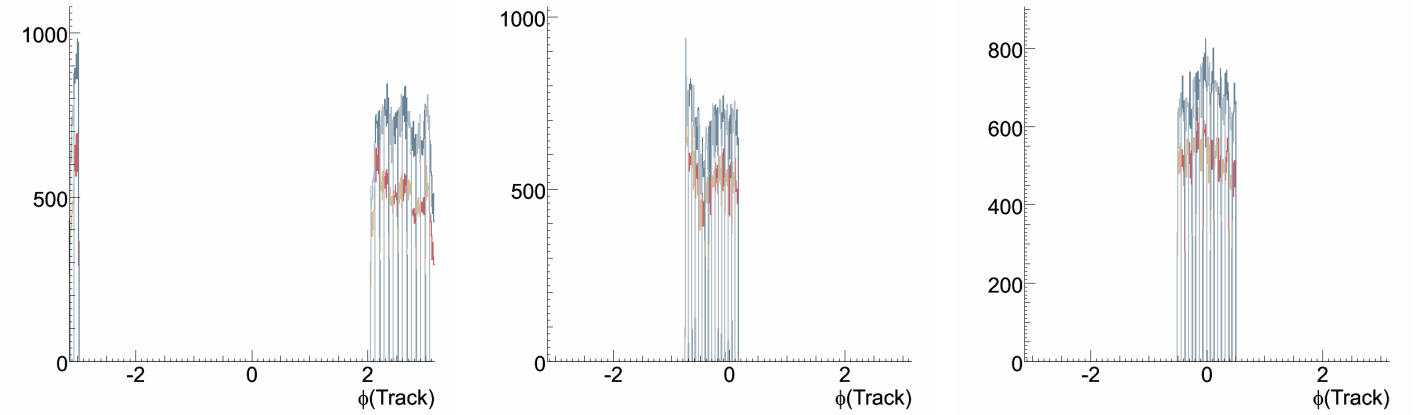


(g) 2B0 and 2B1. (h) 13A5 and 13B1.

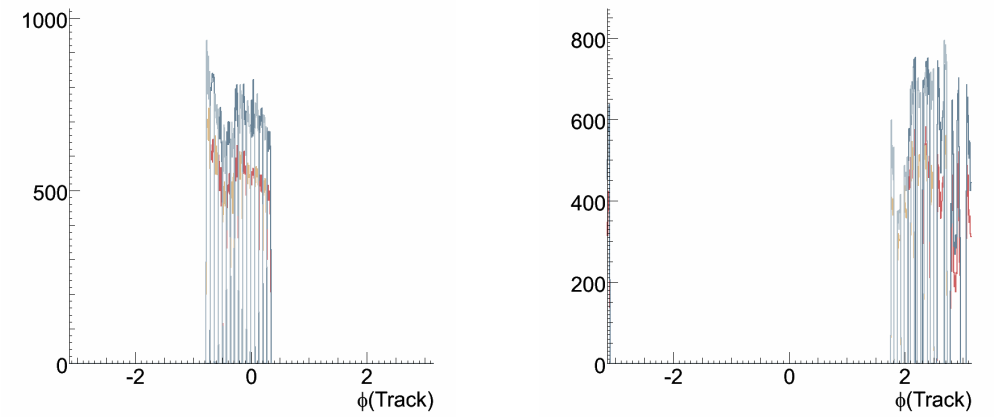
Figure 19: Number of tracks with 16 clusters as a function of ϕ angle. The reddish histograms correspond to the AFEI boards (run 223009) and the bluish histograms correspond to the AFEII boards (run 226107) installed in the slots specified under each plot.



(a) 11B6 and 11B7. (b) 12A0 and 12A1. (c) 12A4 and 12A5.

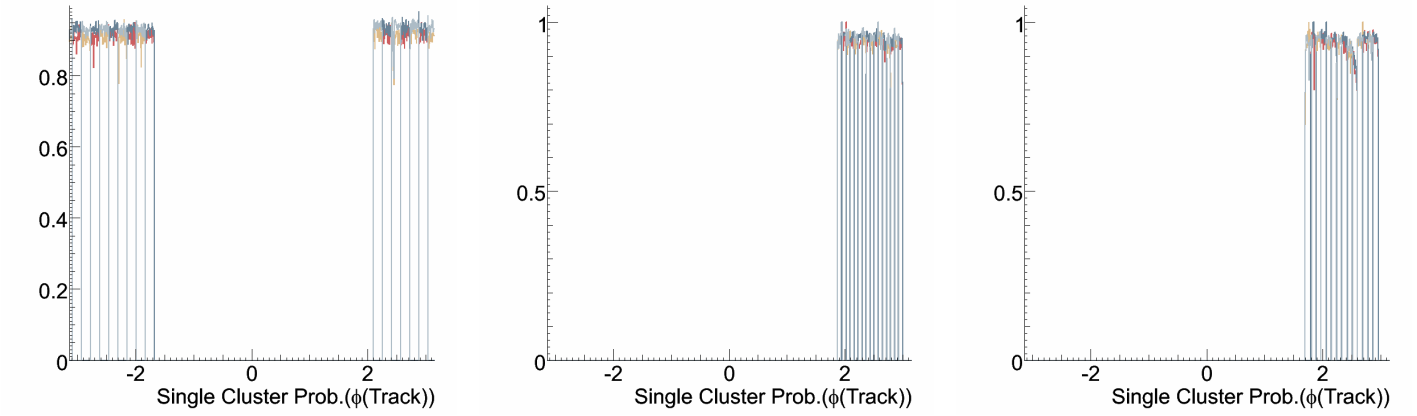


(d) 12B0 and 12B1. (e) 1B0 and 1B1. (f) 1B4 and 1B5.

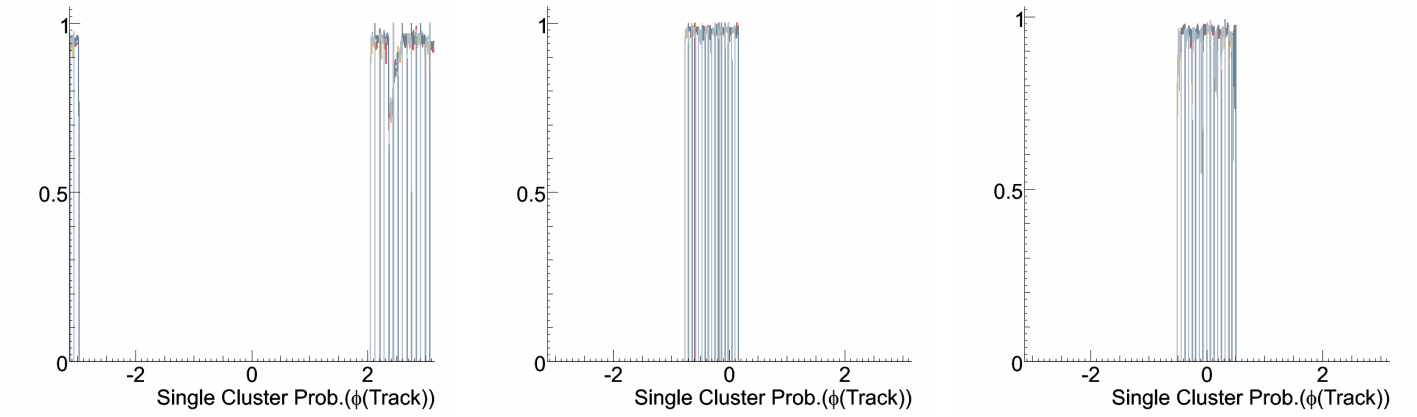


(g) 2B0 and 2B1. (h) 13A5 and 13B1.

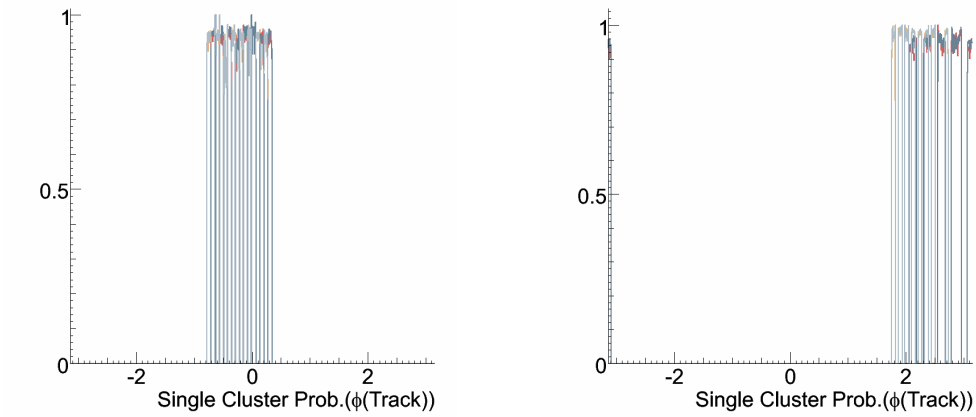
Figure 20: Total number of tracks as a function of ϕ angle. The track may or may not have a cluster in the layer associated with the AFE board. The reddish histograms correspond to the AFEI boards (run 223009) and the bluish histograms correspond to the AFEII boards (run 226107) installed in the slots specified under each plot.



(a) 11B6 and 11B7. (b) 12A0 and 12A1. (c) 12A4 and 12A5.

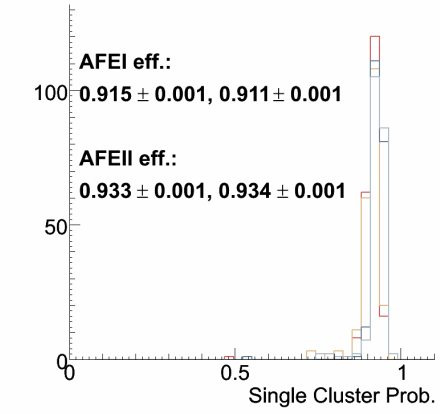


(d) 12B0 and 12B1. (e) 1B0 and 1B1. (f) 1B4 and 1B5.

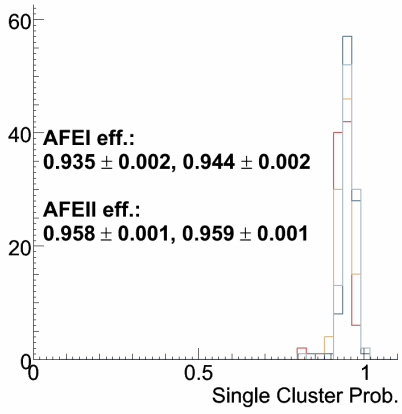


(g) 2B0 and 2B1. (h) 13A5 and 13B1.

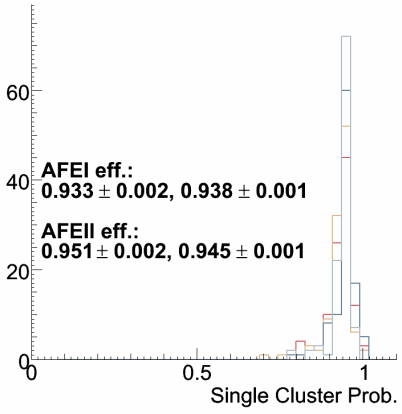
Figure 21: Probability of finding a cluster on the track in the layer read out by the AFE board as a function of ϕ. These histograms represent the result of division of histograms in Figure 36 by the corresponding histograms in Figure 37. The reddish histograms correspond to the AFEI boards (run 223009) and the bluish histograms correspond to the AFEII boards (run 226107) installed in the slots specified under each plot.



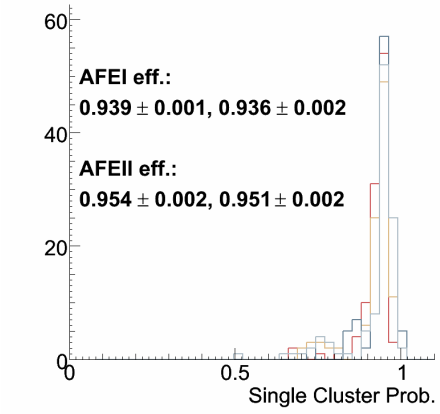
(a) 11B6 and 11B7.



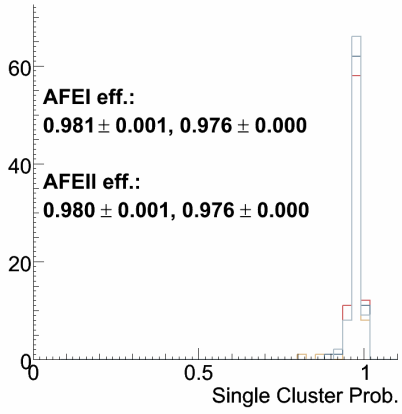
(b) 12A0 and 12A1.



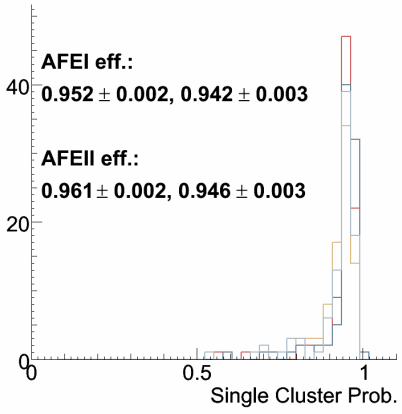
(c) 12A4 and 12A5.



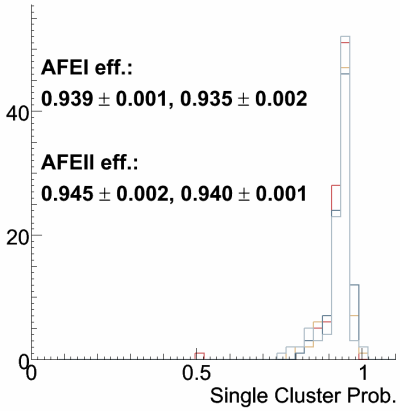
(d) 12B0 and 12B1.



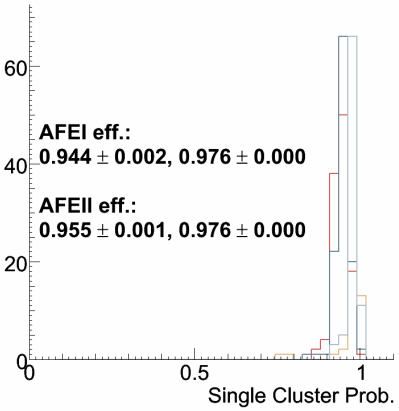
(e) 1B0 and 1B1.



(f) 1B4 and 1B5.

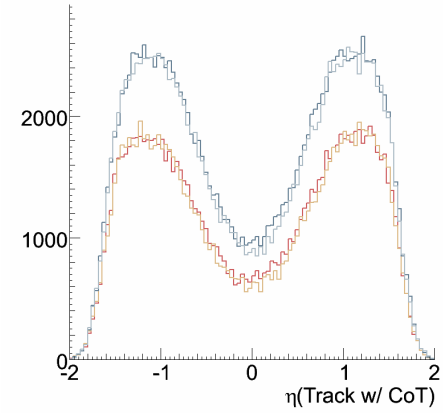


(g) 2B0 and 2B1.

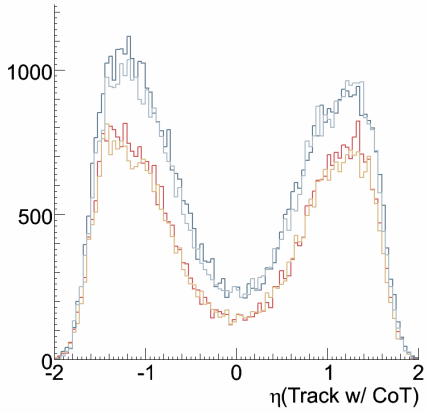


(h) 13A5 and 13B1.

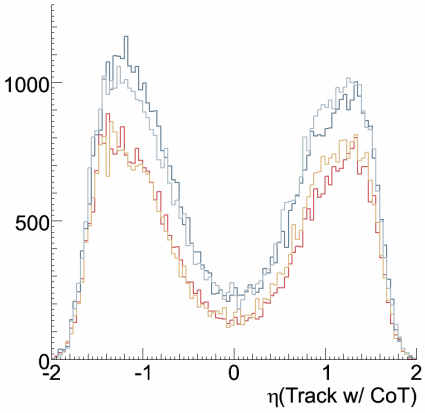
Figure 22: Probability of finding a cluster on the track in the layer read out by the AFE board. The reddish histograms correspond to the AFEI boards (run 223009) and the bluish histograms correspond to the AFEII boards (run 226107) installed in the slots specified under each plot.



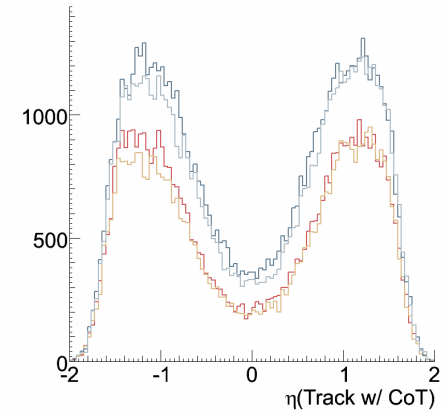
(a) 11B6 and 11B7.



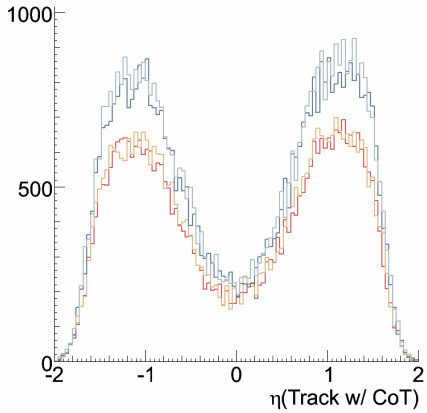
(b) 12A0 and 12A1.



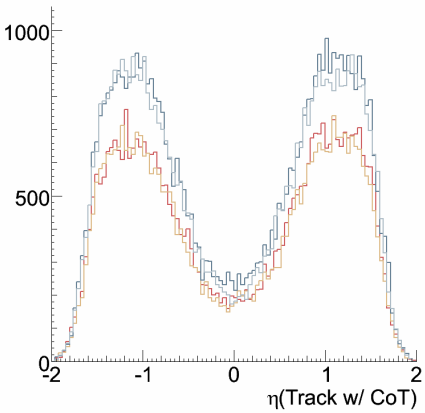
(c) 12A4 and 12A5.



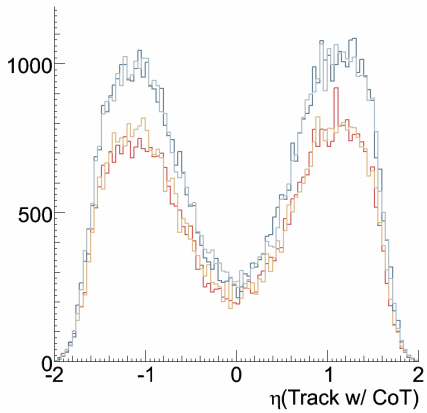
(d) 12B0 and 12B1.



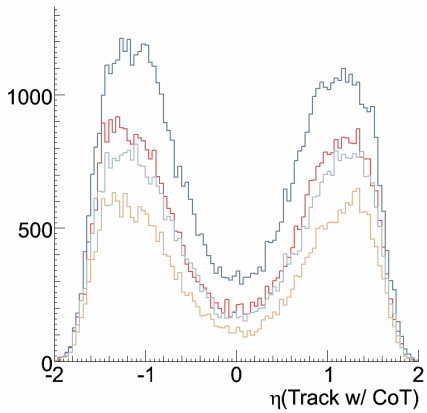
(e) 1B0 and 1B1.



(f) 1B4 and 1B5.

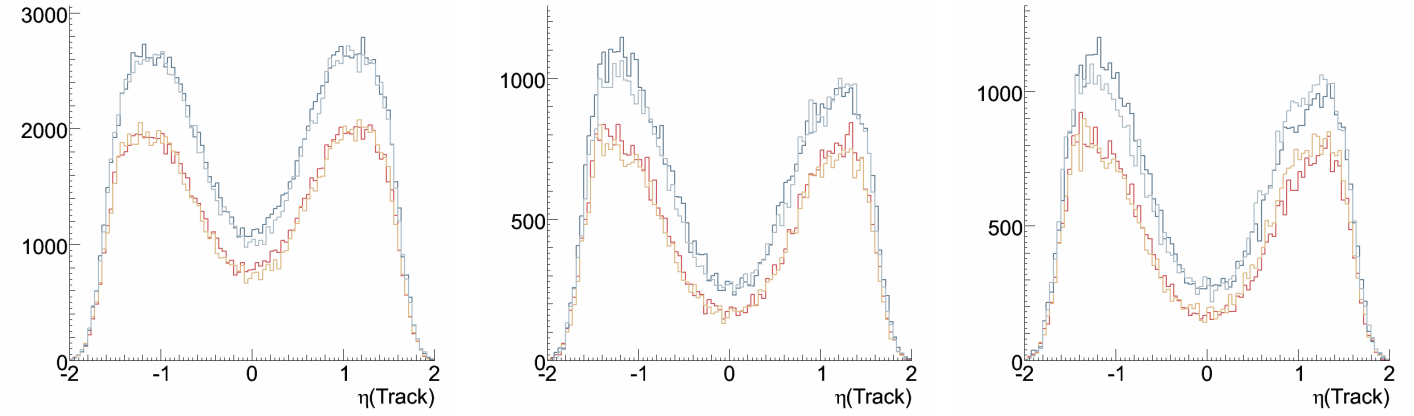


(g) 2B0 and 2B1.



(h) 13A5 and 13B1.

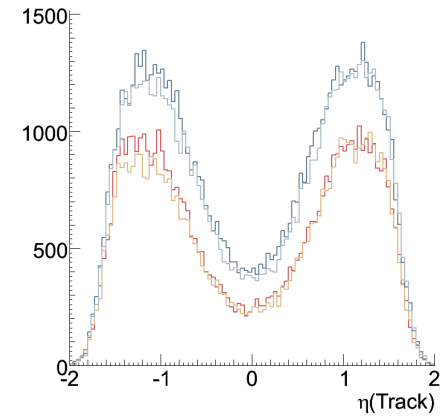
Figure 23: Number of tracks with 16 clusters as a function of η angle. The reddish histograms correspond to the AFEI boards (run 223009) and the bluish histograms correspond to the AFEII boards (run 226107) installed in the slots specified under each plot.



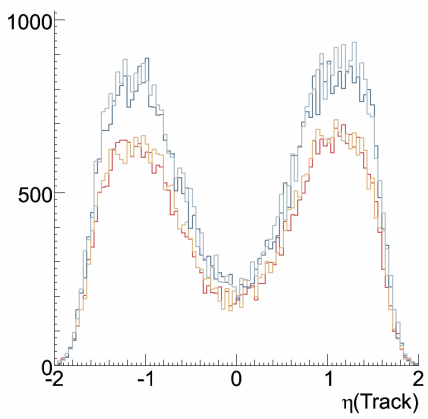
(a) 11B6 and 11B7.

(b) 12A0 and 12A1.

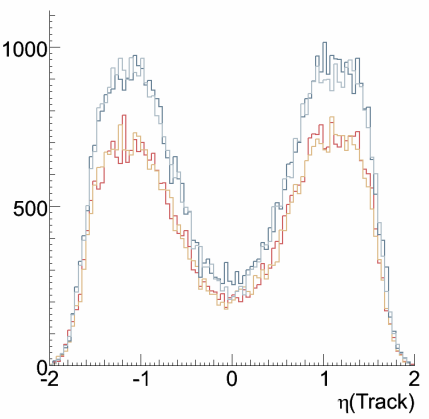
(c) 12A4 and 12A5.



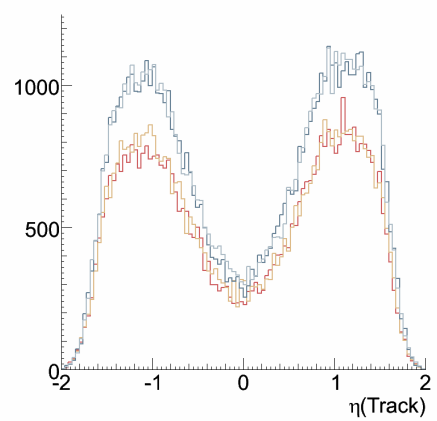
(d) 12B0 and 12B1.



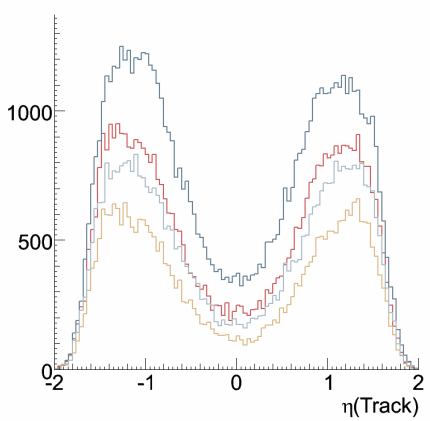
(e) 1B0 and 1B1.



(f) 1B4 and 1B5.

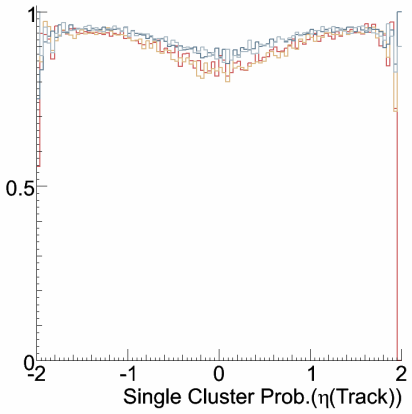


(g) 2B0 and 2B1.

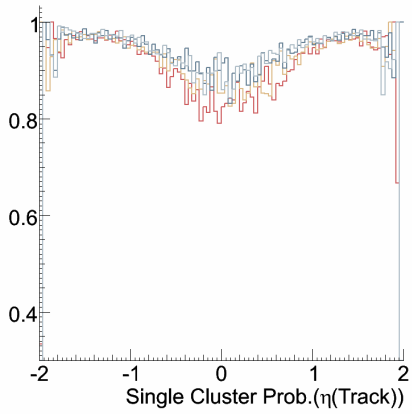


(h) 13A5 and 13B1.

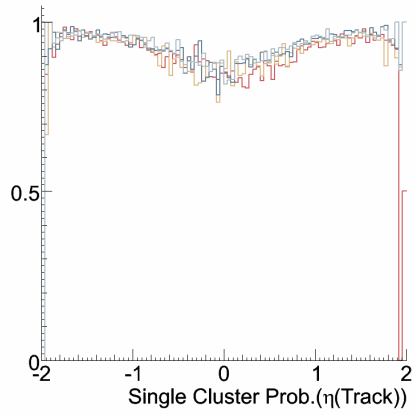
Figure 24: Total number of tracks as a function of η. The track may or may not have a cluster in the layer read out by the AFE board. The reddish histograms correspond to the AFEI boards (run 223009) and the bluish histograms correspond to the AFEII boards (run 226107) installed in the slots specified under each plot.



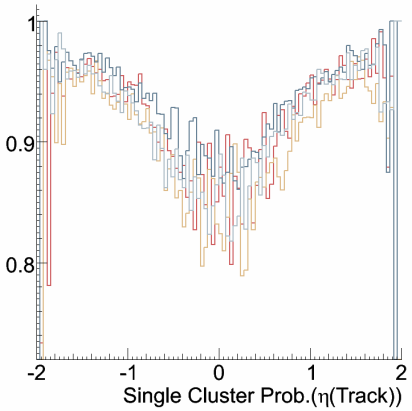
(a) 11B6 and 11B7.



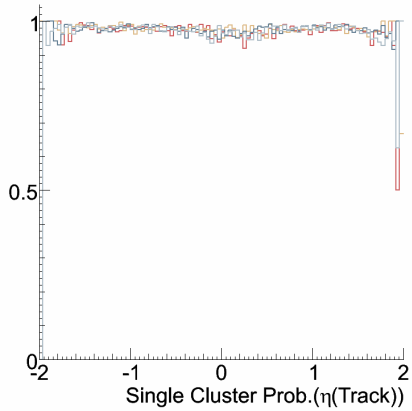
(b) 12A0 and 12A1.



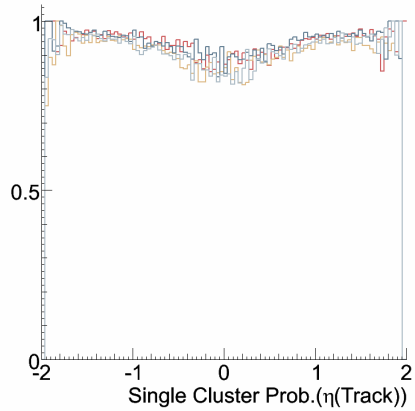
(c) 12A4 and 12A5.



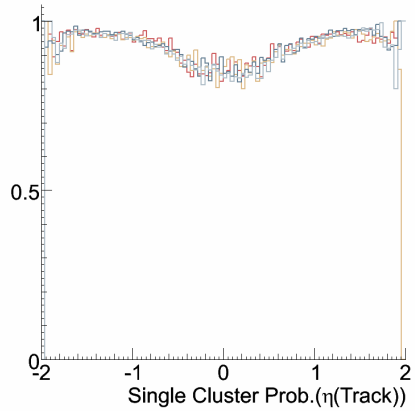
(d) 12B0 and 12B1.



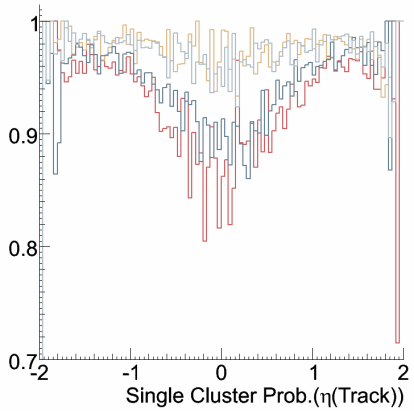
(e) 1B0 and 1B1.



(f) 1B4 and 1B5.

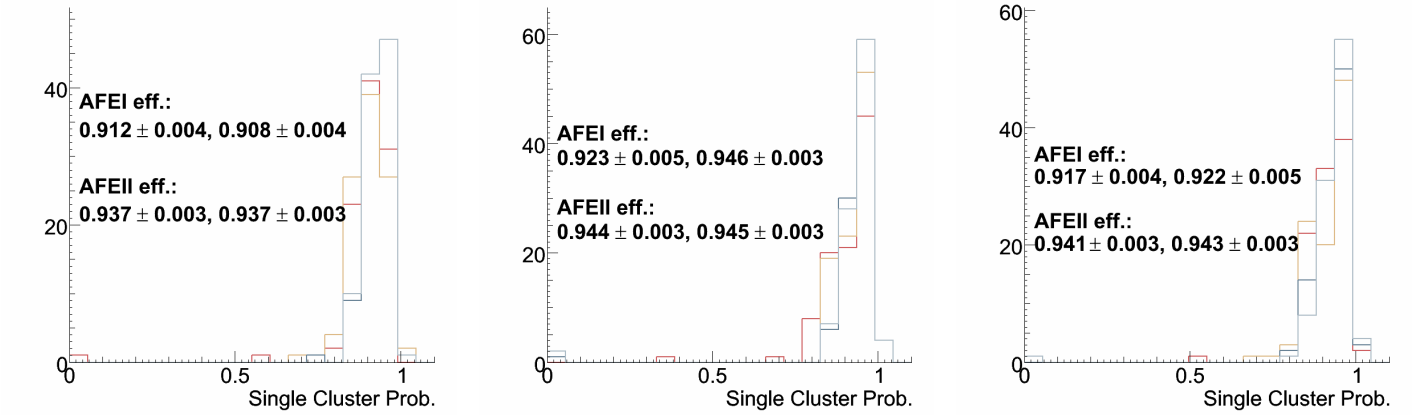


(g) 2B0 and 2B1.



(h) 13A5 and 13B1.

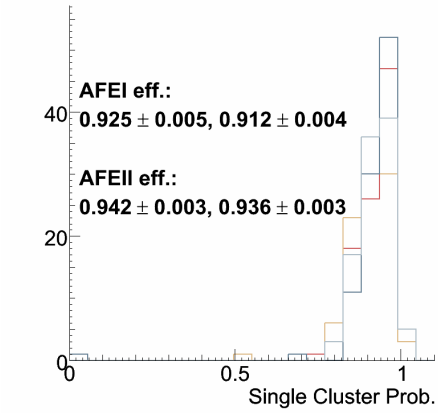
Figure 25: Probability of finding a cluster on the track in the layer read out by the AFE board as a function of η. These histograms represent the result of division of histograms in Figure 40 by the corresponding histograms in Figure 41. The reddish histograms correspond to the AFEI boards (run 223009) and the bluish histograms correspond to the AFEII boards (run 226107) installed in the slots specified under each plot.



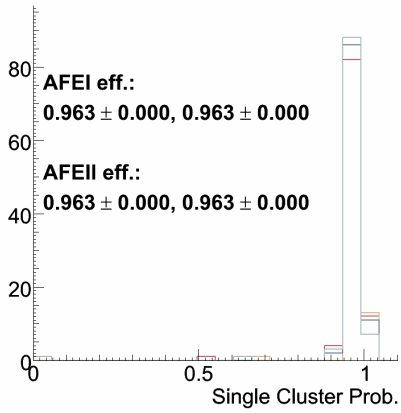
(a) 11B6 and 11B7.

(b) 12A0 and 12A1.

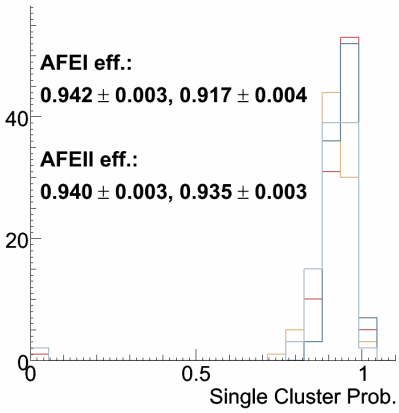
(c) 12A4 and 12A5.



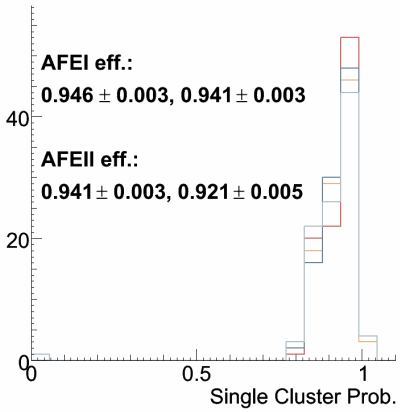
(d) 12B0 and 12B1.



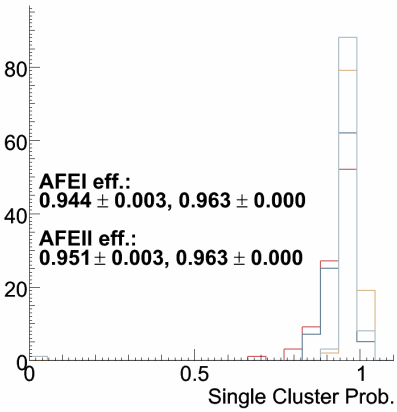
(e) 1B0 and 1B1.



(f) 1B4 and 1B5.



(g) 2B0 and 2B1.

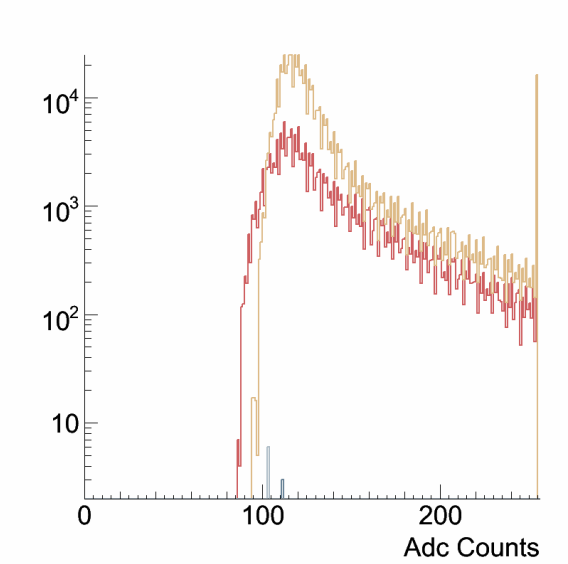


(h) 13A5 and 13B1.

Figure 26: Probability of finding a cluster on the track in the layer read out by the AFE board. The reddish histograms correspond to the AFEI boards (run 223009) and the bluish histograms correspond to the AFEII boards (run 226107) installed in the slots specified under each plot.

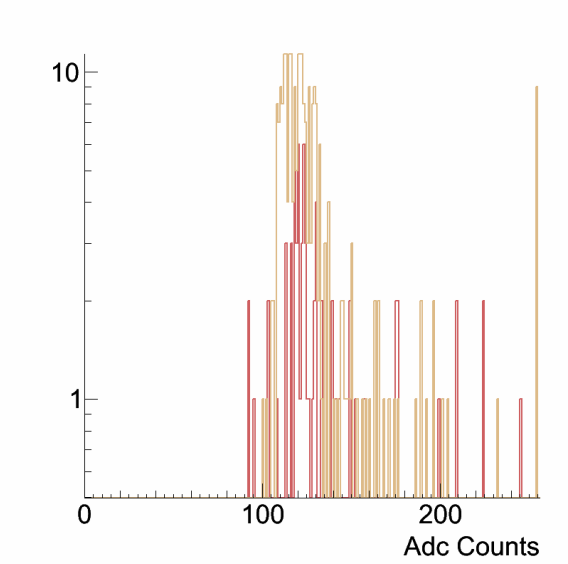
2.1.3 Axial Layer Efficiency

We calculate and compare the single cluster efficiencies in two runs 223008 and 224985. In the period between the given runs 14 AFEI boards were replaced by AFEII boards in the following cryostat slots: 1B0, 1B1, 1B4, 1B5, 11B6, 11B7, 12A0, 12A1, 12A4, 12A5, 12B0, 12B1, 13A5, and 13B1.



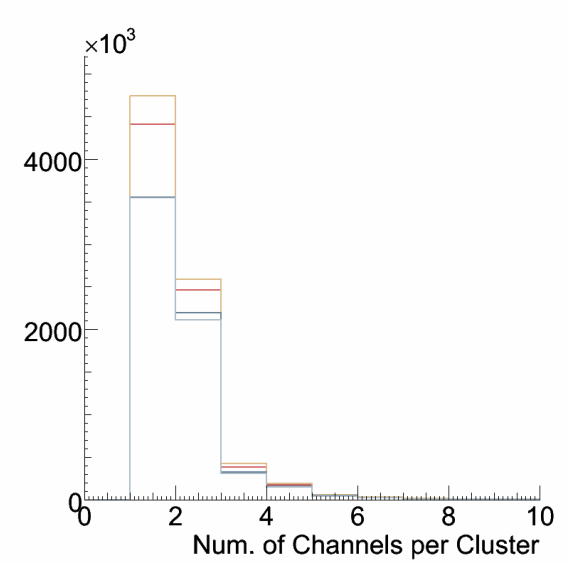
(a) 9A6 and 9A7.

Figure 27: Integral ADC output distributions for all channels in all clusters. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



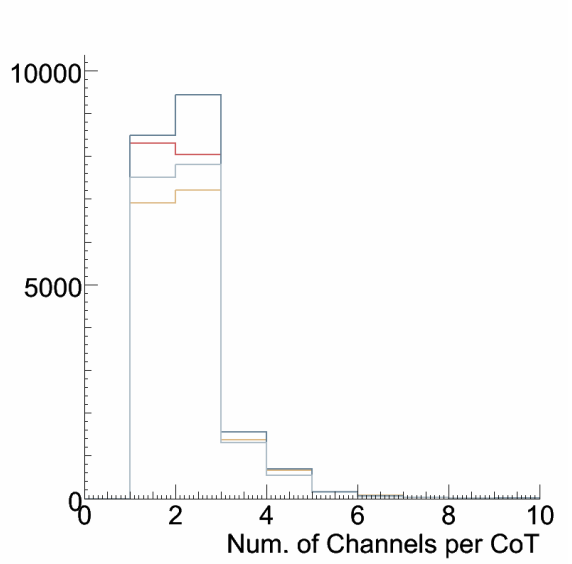
(a) 9A6 and 9A7.

Figure 28: Integral ADC output distribution only for the channels that form a cluster associated with a track. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



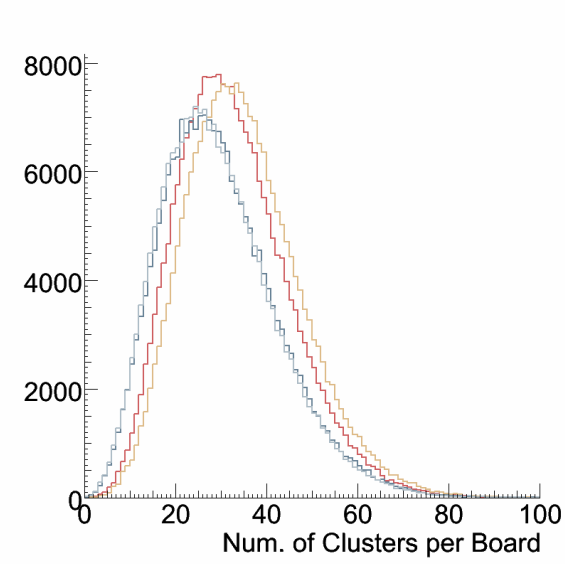
(a) 9A6 and 9A7.

Figure 29: Number of channels per cluster, *i.e.* cluster's size. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



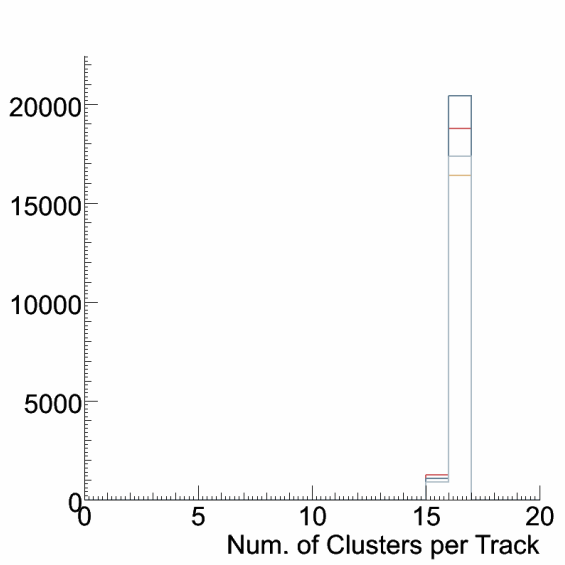
(a) 9A6 and 9A7.

Figure 30: Number of channels per cluster associated with a track. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



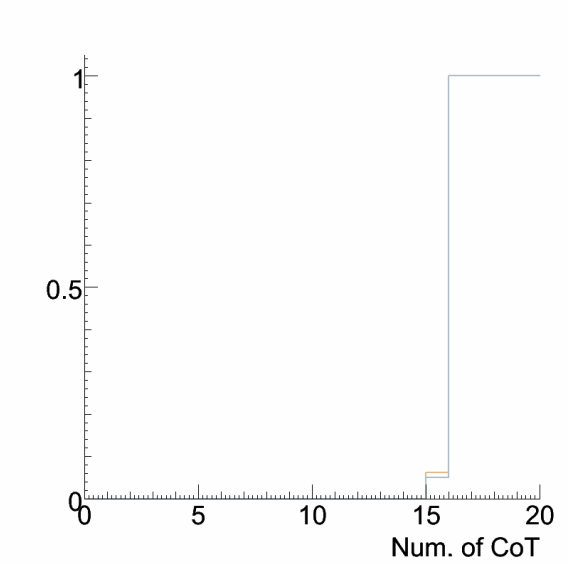
(a) 9A6 and 9A7.

Figure 31: Number of clusters per board. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



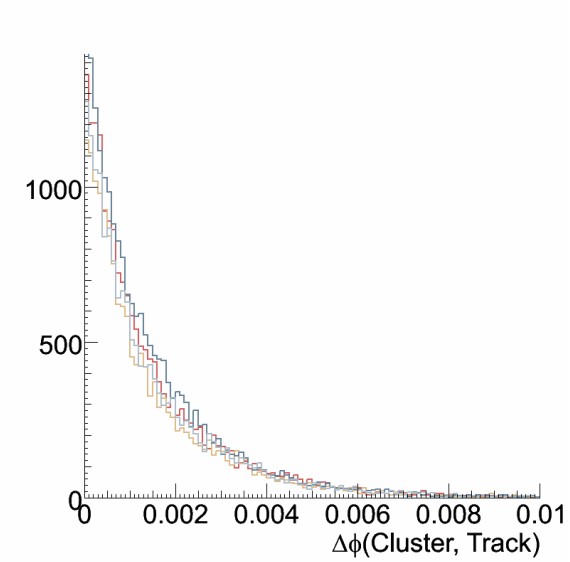
(a) 9A6 and 9A7.

Figure 32: Number of clusters per track. Note that we select tracks with 15 or 16 clusters on them with a possibly missing cluster from the board in question. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



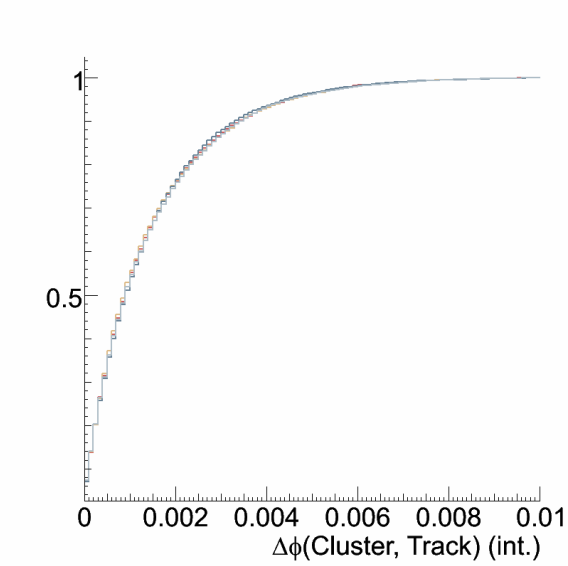
(a) 9A6 and 9A7.

Figure 33: Cumulative distribution of the number of clusters per track (see Figure 32). The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



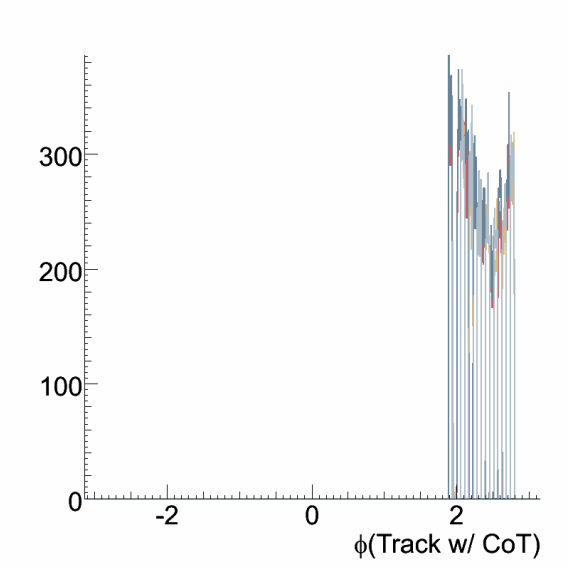
(a) 9A6 and 9A7.

Figure 34: Distance in radians from the track to the cluster associated with that track. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



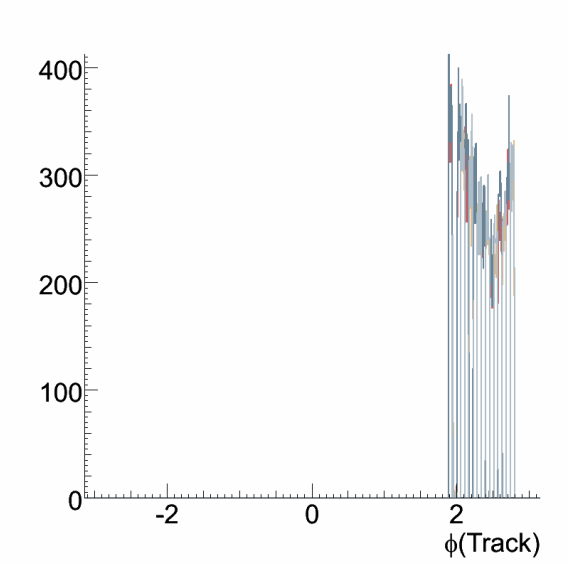
(a) 9A6 and 9A7.

Figure 35: Cumulative distribution of the distance from the track to the cluster associated with that track (see Figure **??**). The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



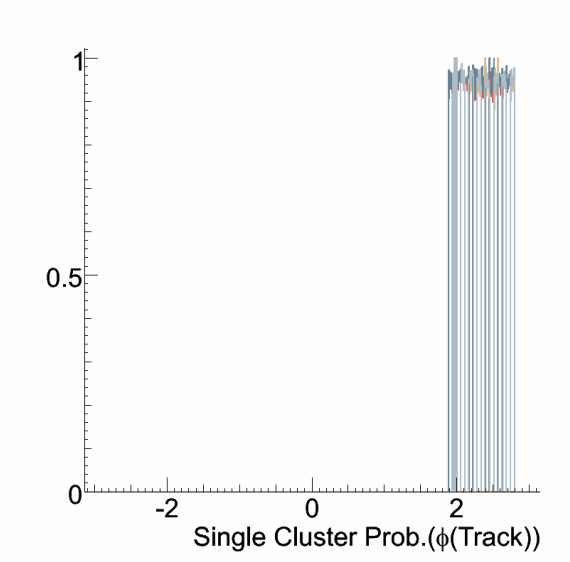
(a) 9A6 and 9A7.

Figure 36: Number of tracks with 16 clusters as a function of ϕ angle. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



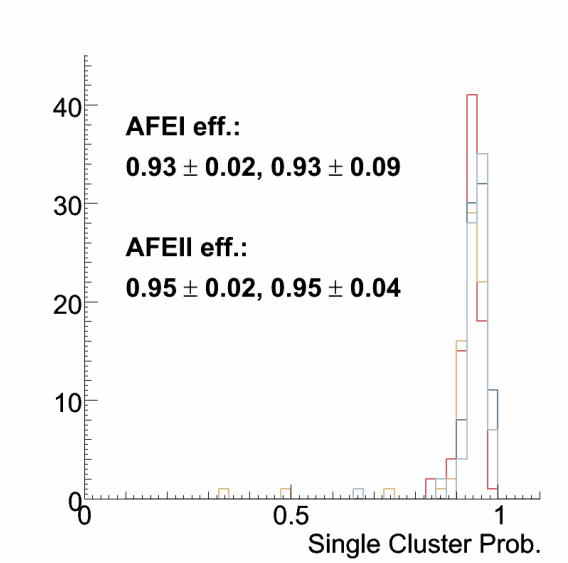
(a) 9A6 and 9A7.

Figure 37: Total number of tracks as a function of ϕ angle. The track may or may not have a cluster in the layer associated with the AFE board. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



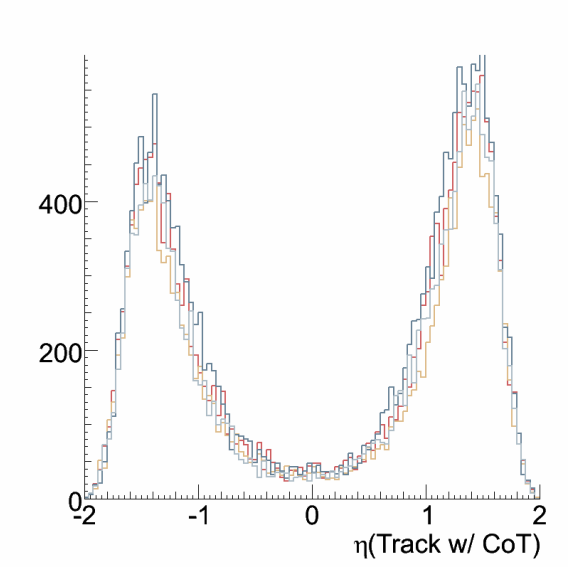
(a) 9A6 and 9A7.

Figure 38: Probability of finding a cluster on the track in the layer read out by the AFE board as a function of ϕ. These histograms represent the result of division of histograms in Figure 36 by the corresponding histograms in Figure 37. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



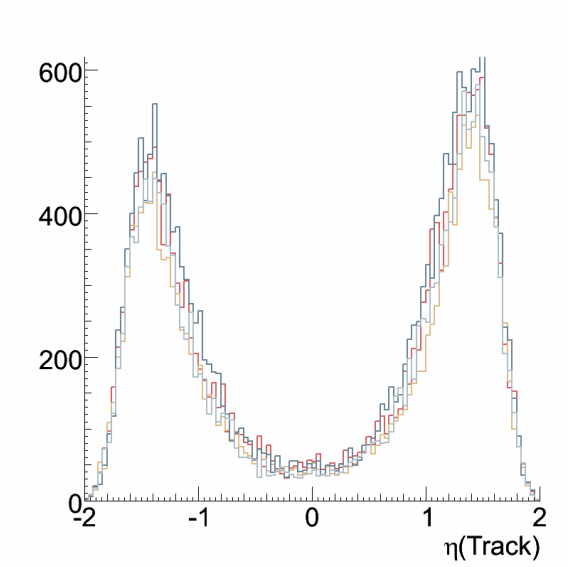
(a) 9A6 and 9A7.

Figure 39: Probability of finding a cluster on the track in the layer read out by the AFE board. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



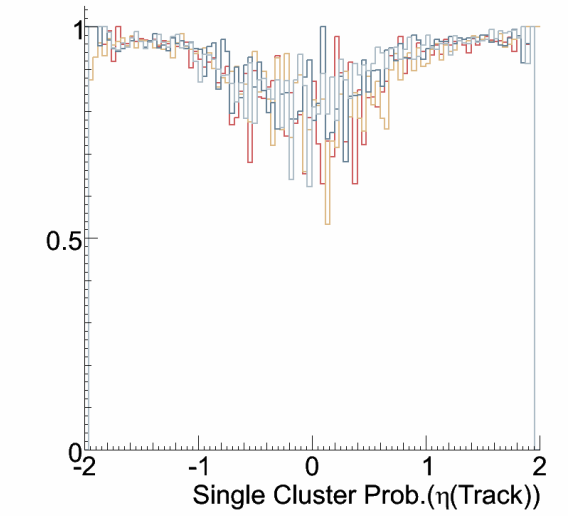
(a) 9A6 and 9A7.

Figure 40: Number of tracks with 16 clusters as a function of η angle. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



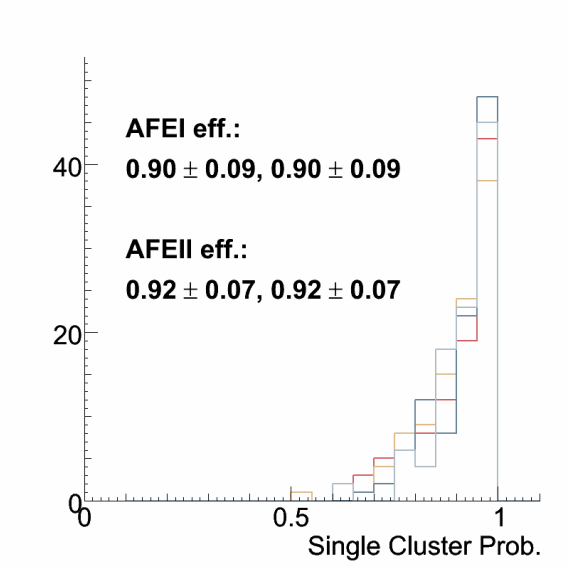
(a) 9A6 and 9A7.

Figure 41: Total number of tracks as a function of η. The track may or may not have a cluster in the layer read out by the AFE board. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



(a) 9A6 and 9A7.

Figure 42: Probability of finding a cluster on the track in the layer read out by the AFE board as a function of η. These histograms represent the result of division of histograms in Figure 40 by the corresponding histograms in Figure 41. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.



(a) 9A6 and 9A7.

Figure 43: Probability of finding a cluster on the track in the layer read out by the AFE board. The reddish histograms correspond to the AFEI boards (run 223008) and the bluish histograms correspond to the AFEII boards (run 224985) installed in the slots specified under each plot.