L00 @ 1x8 and 36x36

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Introduction

- Analysis of the L00 signals with the 1x8 and 36x36 data

only at cluster level, no link with tracks

✌ Active regions of the L00

Barrel	Wedge	Ladders
0	6	0,2,1
0	7	0,2,1

- Data format
  - 1x8: read all
  - 36x36: DPS on

- Data analysis

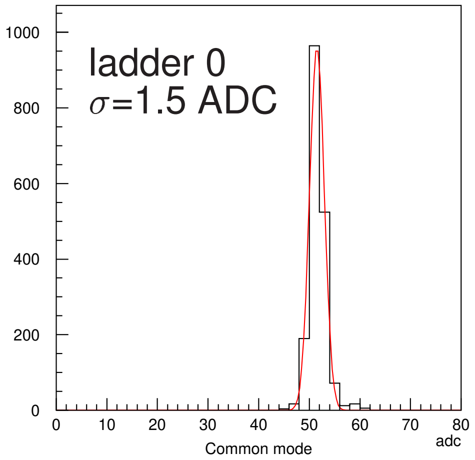
❶ Common mode calculation and subtraction
1x8 only

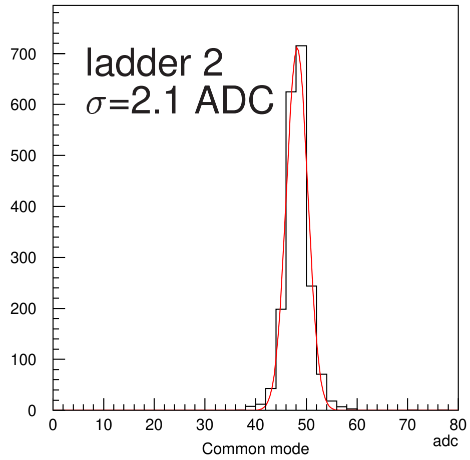
❷ Pedestal and noise calculation.

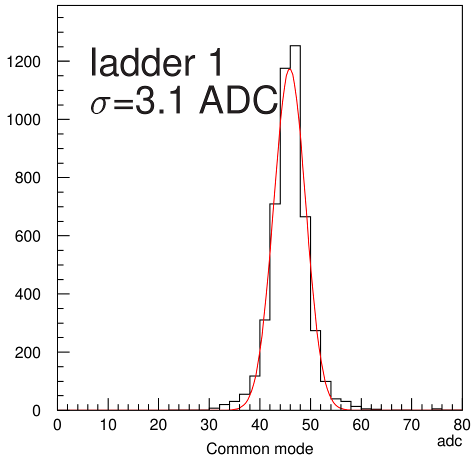
❸ Search for hits

Common mode @ 1x8

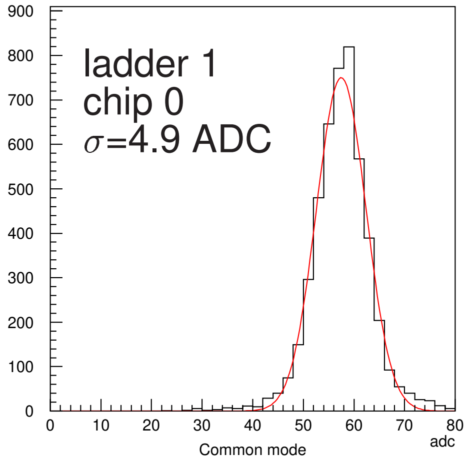
- Run 111207
- Wedge 6

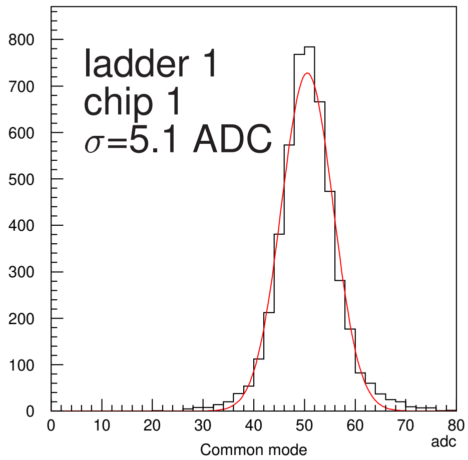






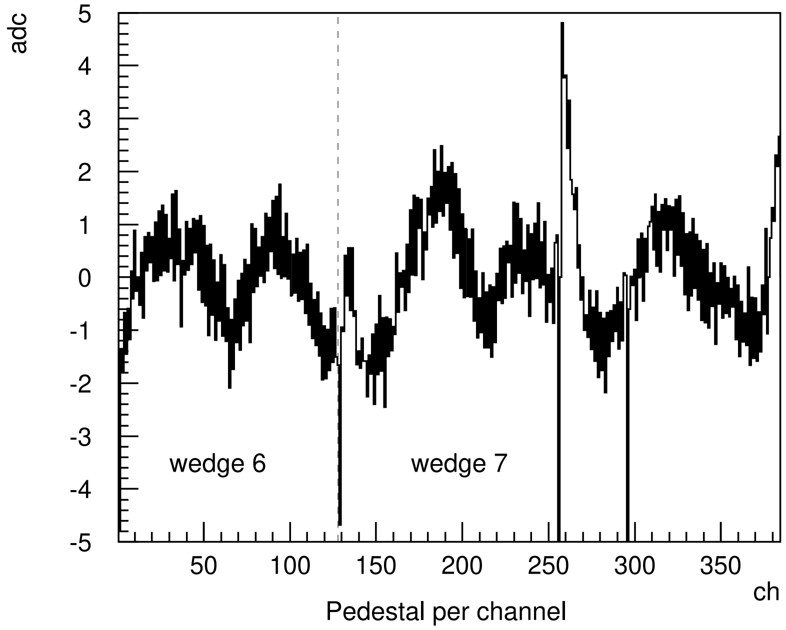
- Wedge 7



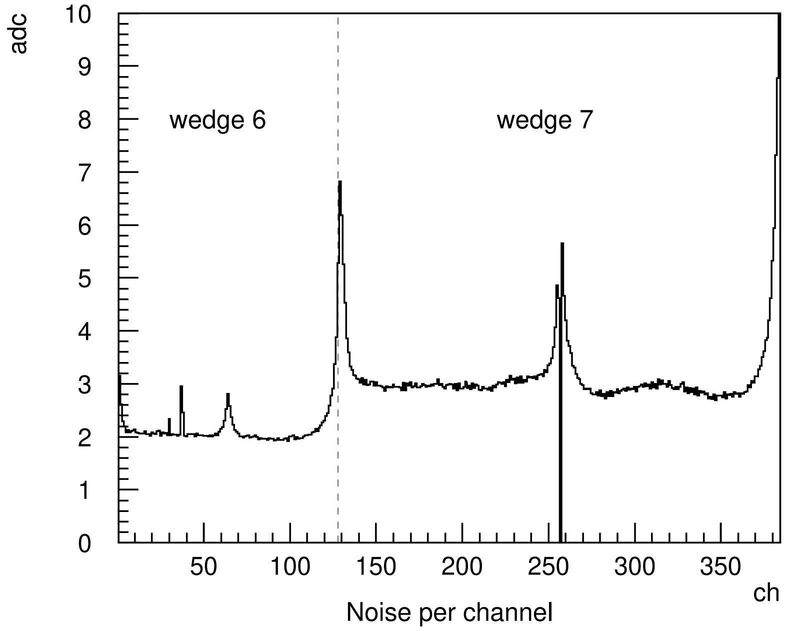


Pedestal and noise @ 1x8

✎ Pedestals: run 111207



✎ Noise: run 111207



Cluster search

☞ Use events with Myron bucket 1

✎ Cluster search algorithm

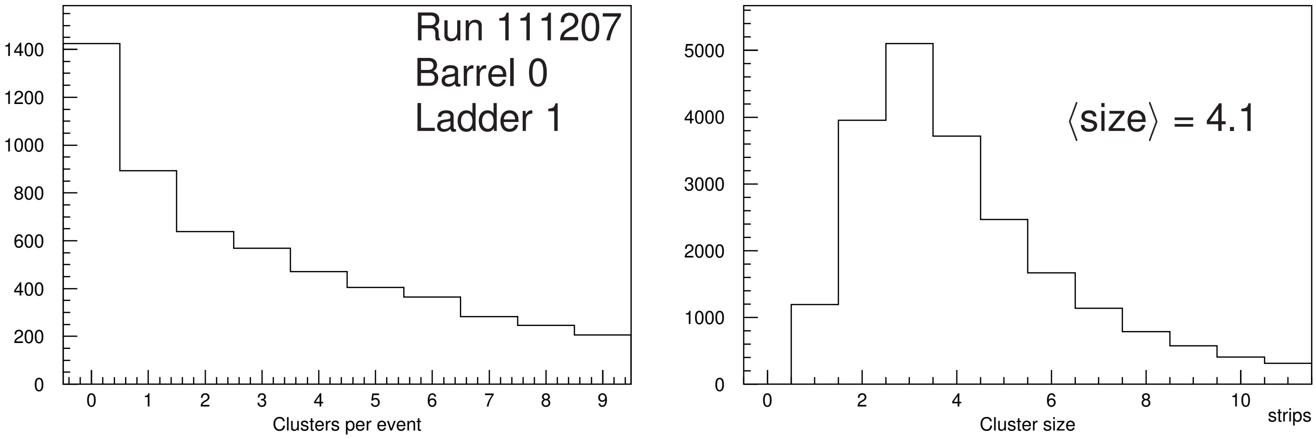
❶ define significance s= Q/noise
❷ seed channels ($s \geq$3)
❸ add up to $\pm$ 10 neighbours with $s \geq$2
❹ search ends when no seeds remain

✎ Cluster properties

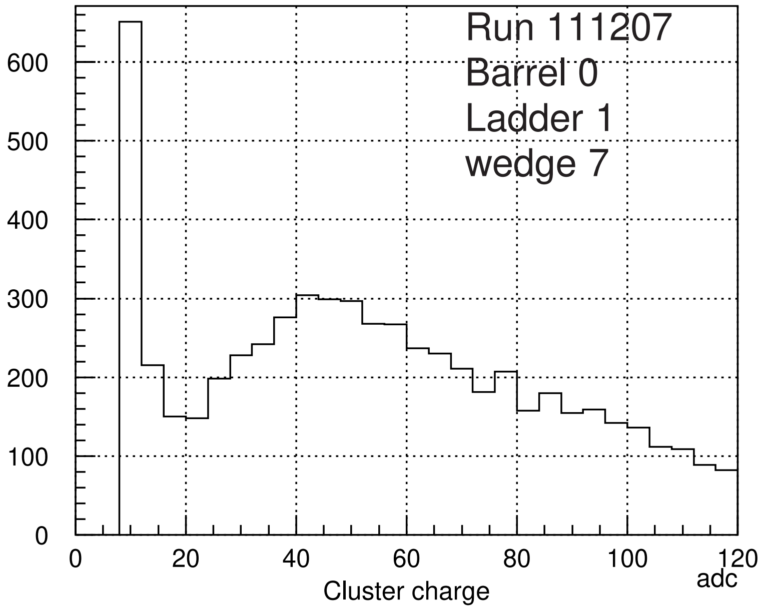
❶ primary channel (seed)
❷ size (strips in the cluster)
❸ charge ($q = \Sigma q_i$)
❹ significance ($s = \Sigma s_i$) (signal to noise)

Cluster properties @ 1x8

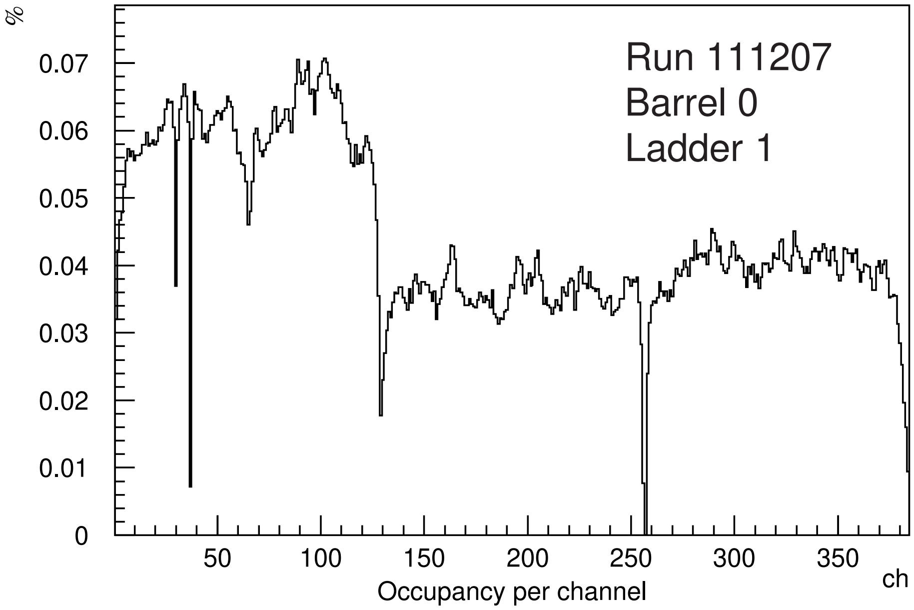
- Clusters per event and size



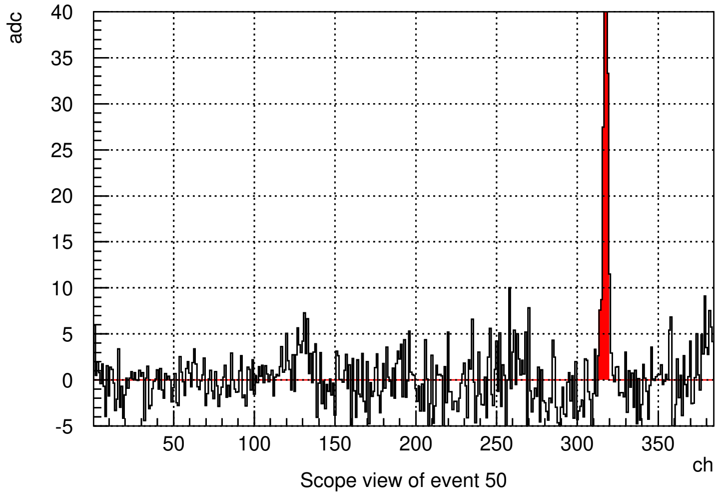
- Cluster charge

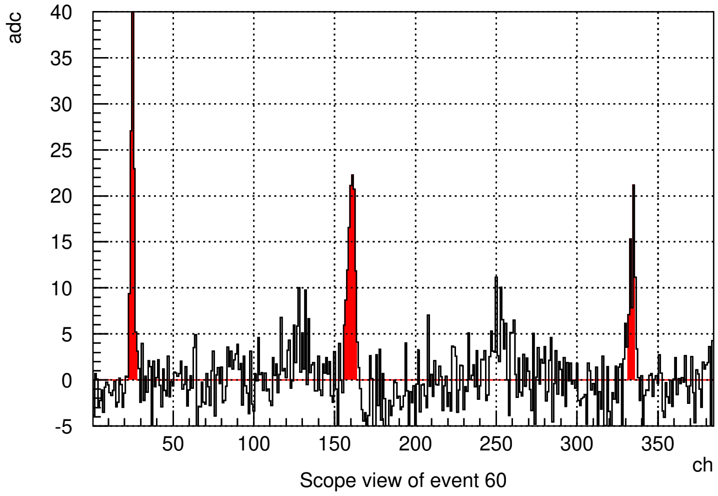


- Occupancy per channel



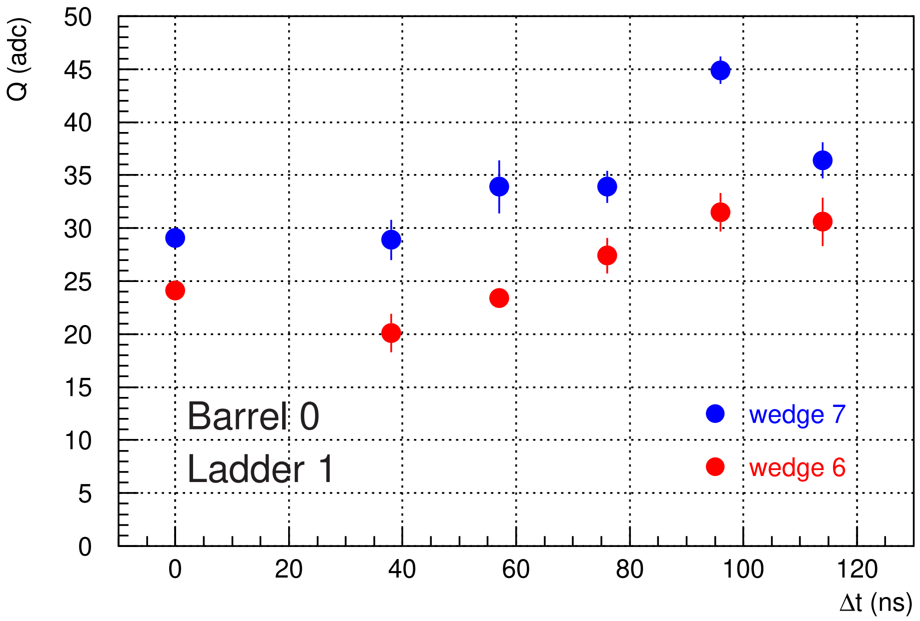
- Scope view (Barrel 0 Ladder 1)



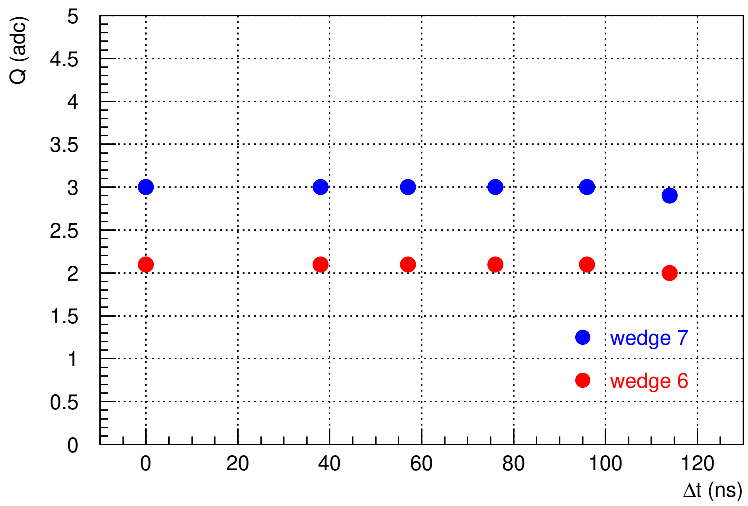


Timing scan

- Proper timing to get the most of the charge



- Timing does not affect the noise



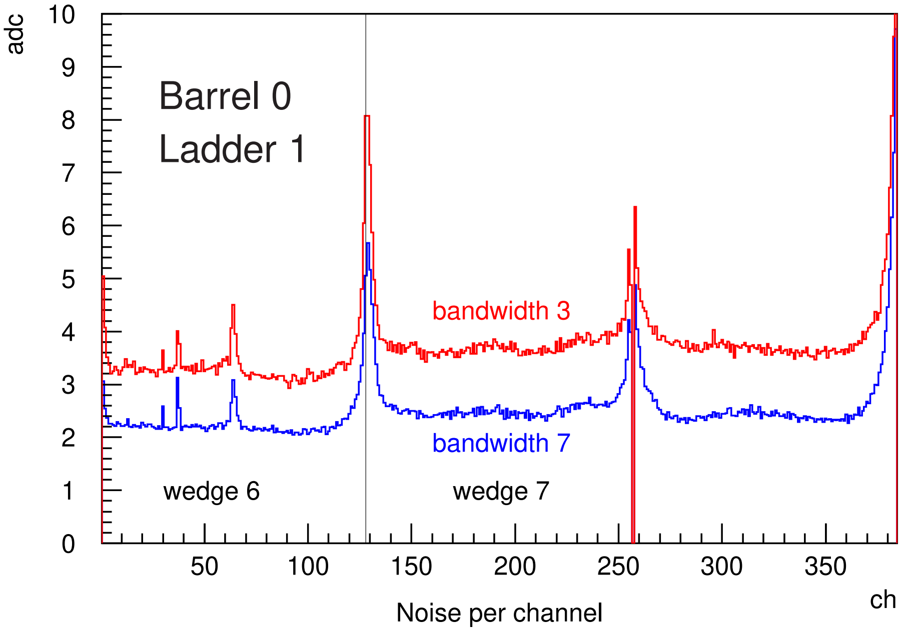
☆ Best: s/n = 15:1

uncorrected for incident angle

Bandwidth studies

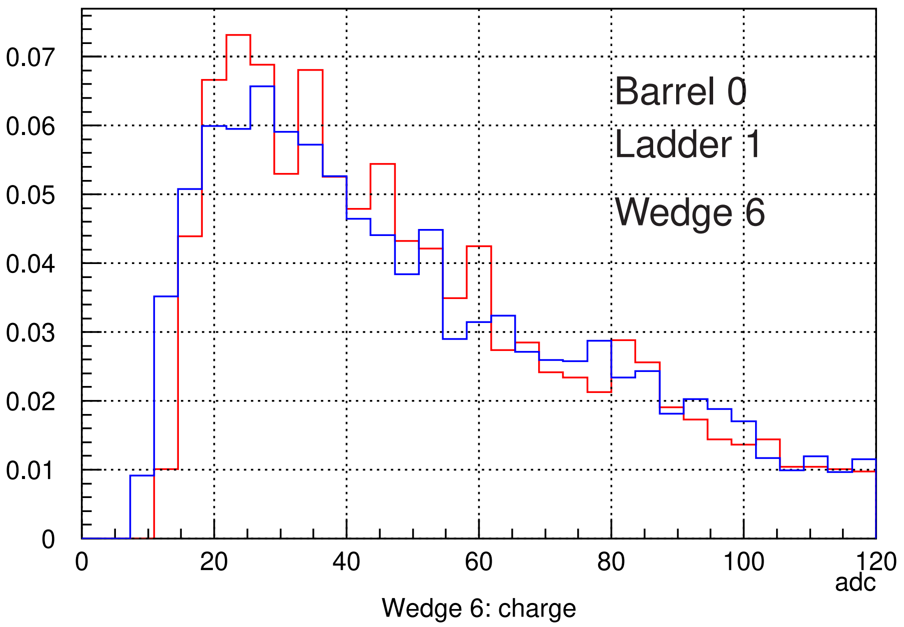
- The change in the bandwidth may affect both signal and noise

- Noise



- Charge

num. of clusters > 1 ➪

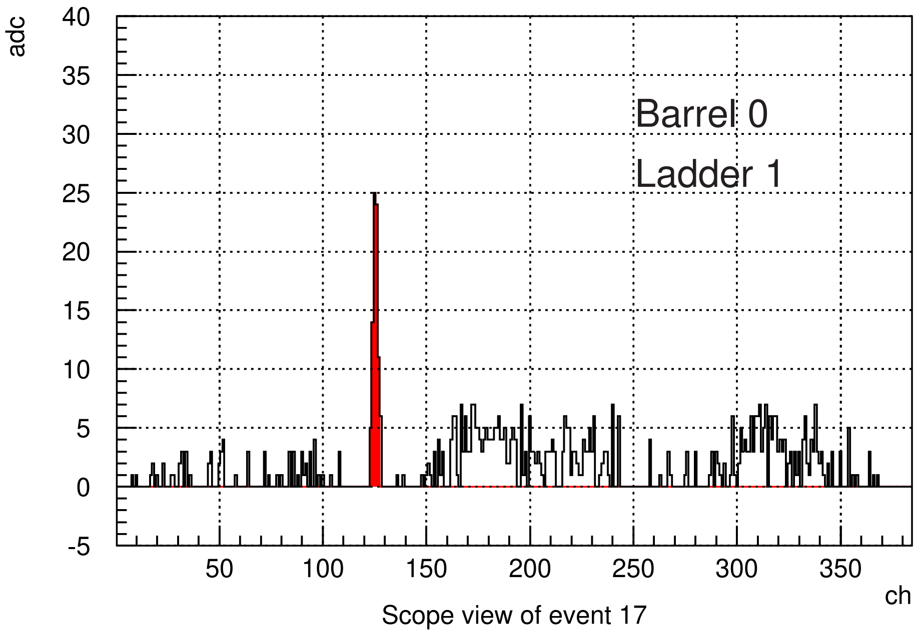


☆ Best s/n with bandwidth 7 but... timing ?

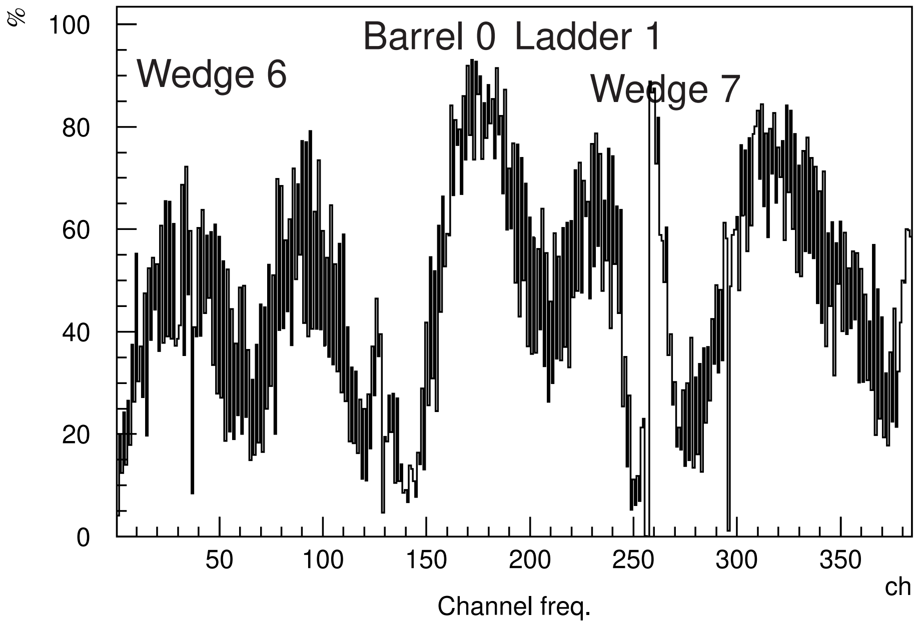
36x36 Data

☞ DPS on

- Scope view



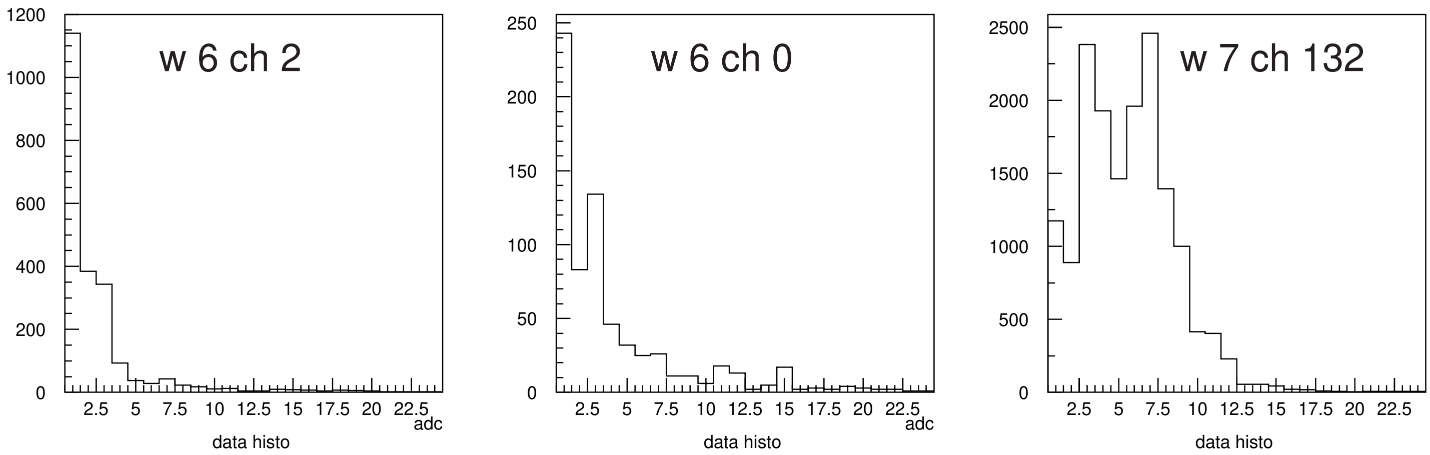
- Channel frequency on data (run 113454)



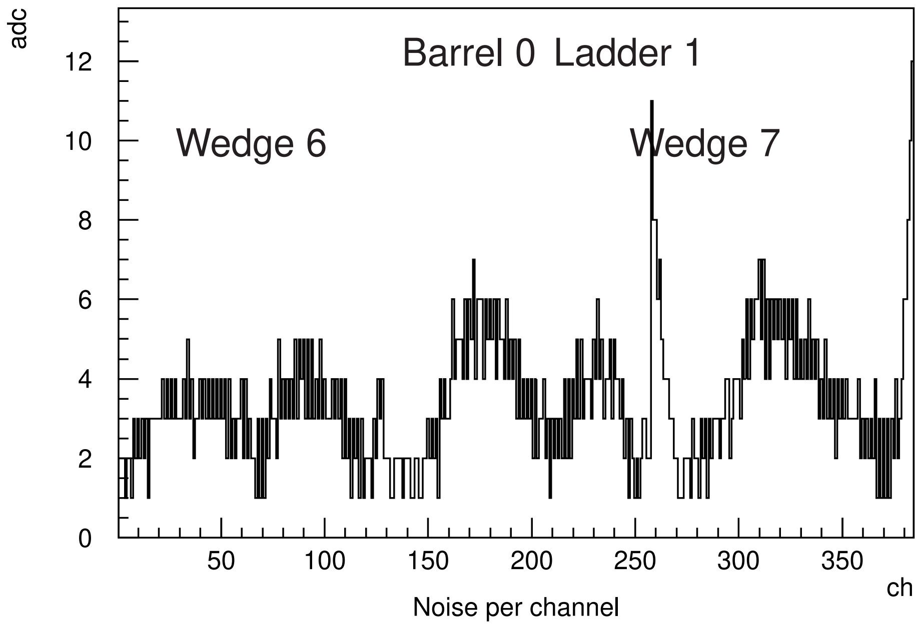
Channels

• ADC distribution per channel

Barrel 0 ladder 1



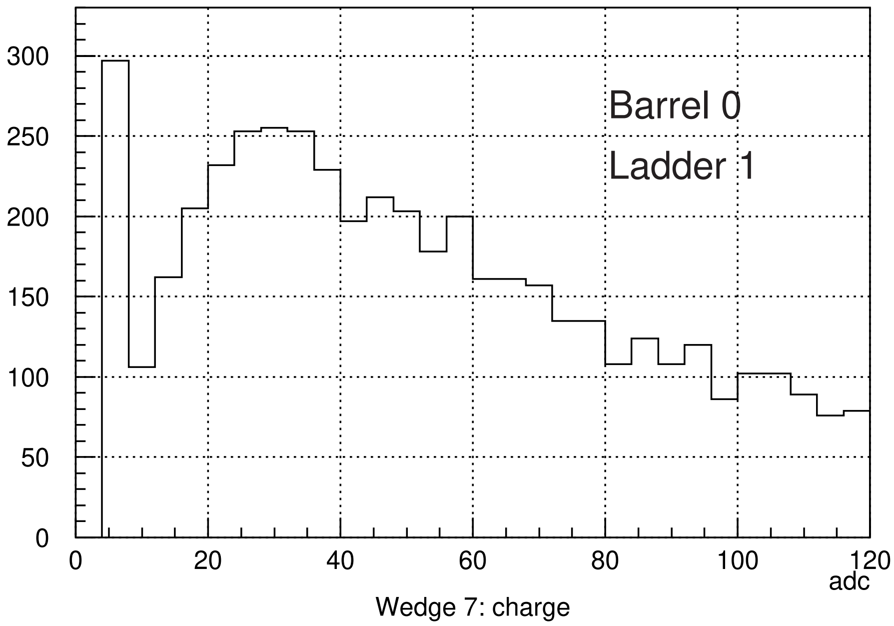
• Noise channel by channel



Cluster properties @ 36x36

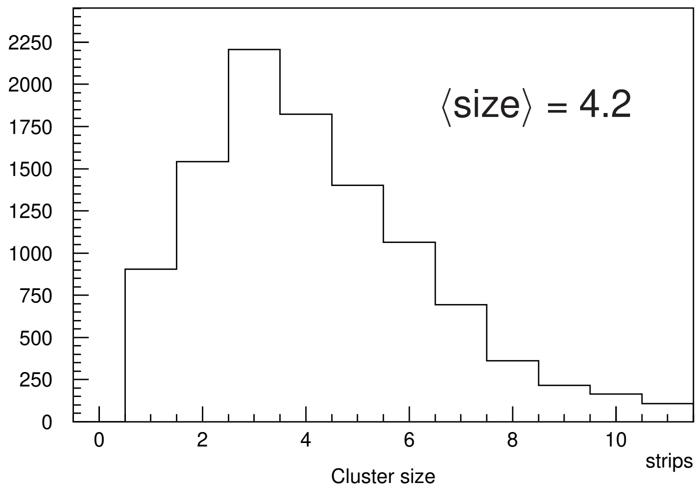
• Cluster charge (run 113454)

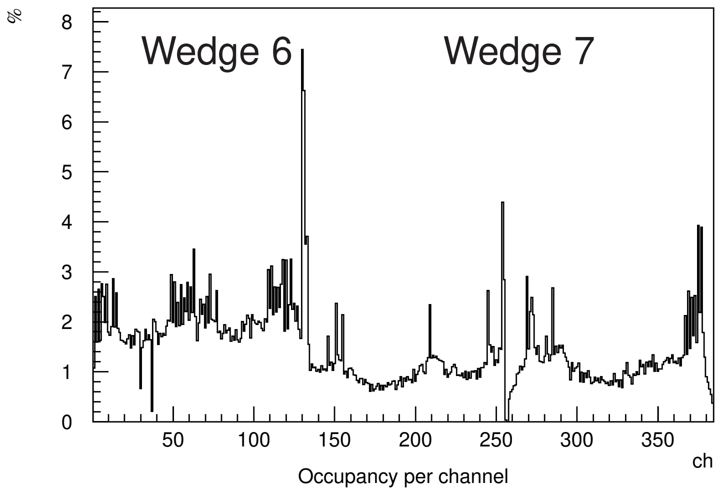
uncorrected for incident angle



s/n ≈ 10:1

• Cluster size and channel occupancy





Summary

❶ Analysis of the L00 data during the 1x8 run

☞ Read all

❷ Timing scan: signal pulse

☞ Recommendation: Δt = 96 ns

❸ Evaluation of the different bandwidth

☞ Recommendation: bw = 7 (timing??)

❹ Signal to noise ratio is 15:1

☞ in optimal conditions

❺ Analysis of the L00 data during the 36x36 run

☞ DPS on

❻ cluster size is similar in read all and DPS on

❼ Signal to noise ratio obtained is 10:1

❽ Noise ??