

Run 3 preliminary data analysis

Analysis of the background, pedestal and ^{55}Fe data from Run 3 13/05 to 25/05/2023 (runs 19909 - 20415)

- Energy spectrum
- Length spectrum
- dE/dx distributions

Data import

Background data:

"run_description" == "Standard"
&
"pedestal_run"==0

	Run	sc_integral	sc_length
0	20415	123727.273438	1151.520508
1	20415	72772.726562	1975.152344
2	20415	15705.218750	1231.141235
3	20415	14639.198242	302.947968
4	20415	10178.889648	400.727722
...
4371877	19915	866.076660	135.067932
4371878	19915	737.301331	66.883408
4371879	19915	506.372498	51.004112
4371880	19915	409.848419	38.534946
4371881	19915	316.870178	50.979115

Pedestal data:

"run_description" == "Standard"
&
"pedestal_run" == 1

	Run	sc_integral	sc_length
0	20407	30605.068359	587.338013
1	20407	18710.335938	880.471924
2	20407	16122.526367	721.643005
3	20407	9944.841797	342.013855
4	20407	5817.343262	154.239960
...
161297	19909	140.813431	51.465046
161298	19909	127.670303	67.652649
161299	19909	70.135597	36.410980
161300	19909	65.452644	90.167175
161301	19909	39.348450	16.312805

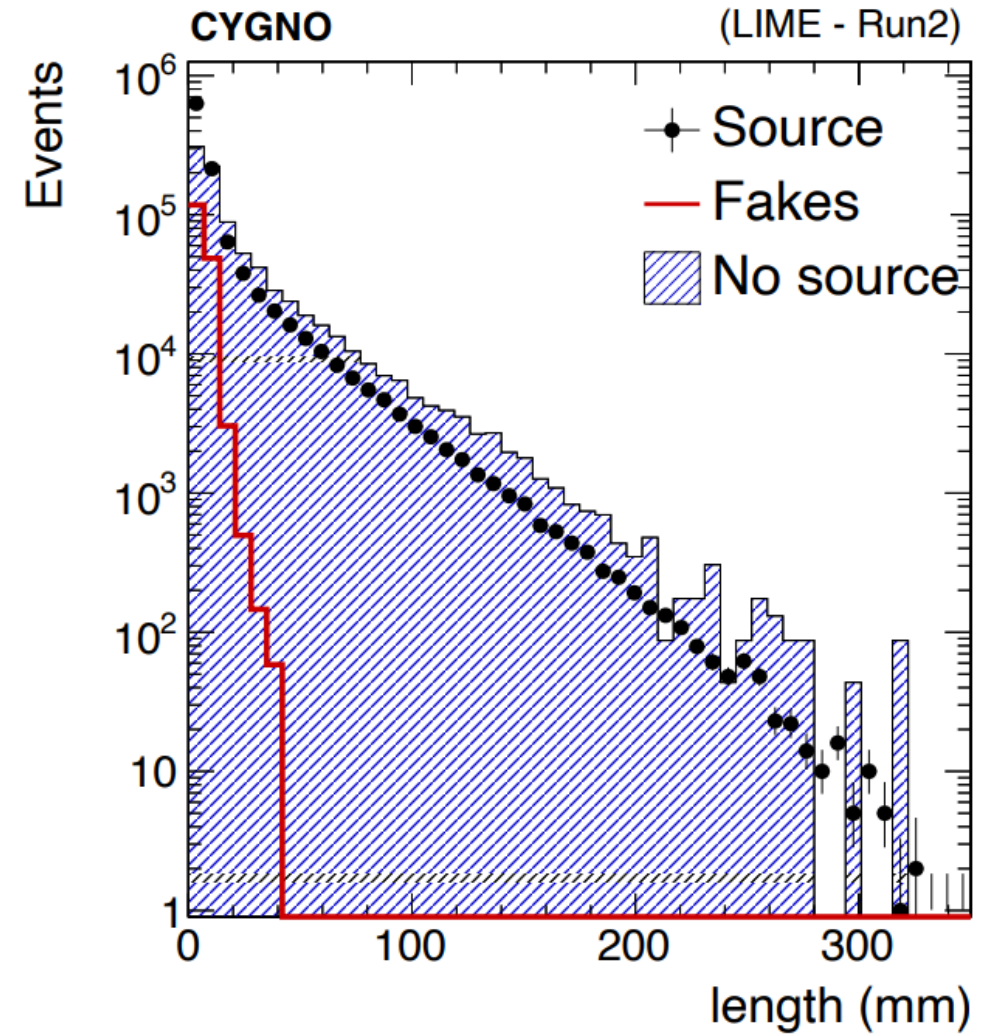
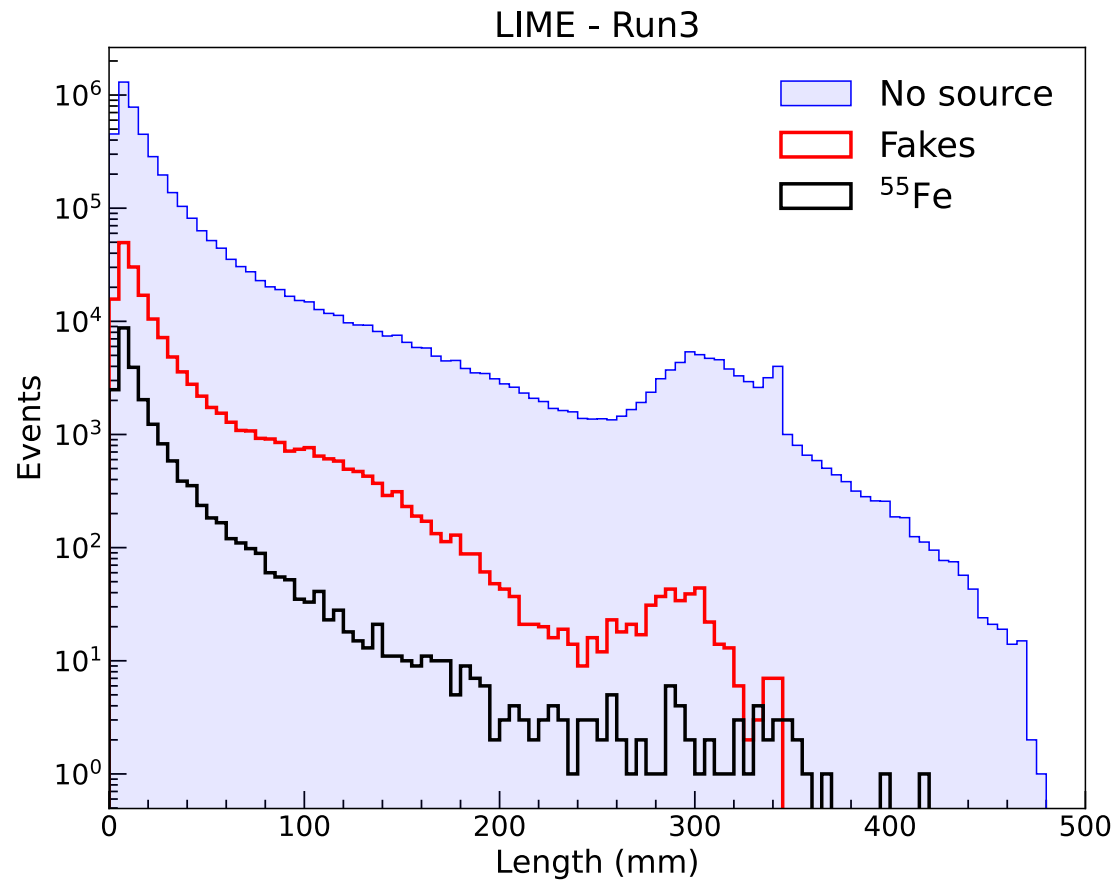
⁵⁵Fe data:

"run_description" == "Daily Calibration, step 3"

	Run	sc_integral	sc_length
0	20282	84364.421875	2046.973877
1	20282	11403.835938	42.861317
2	20282	9290.566406	40.405136
3	20282	8298.375000	751.001343
4	20282	6503.354004	168.519089
...
22146	20072	228.435516	59.816559
22147	20072	219.386887	44.232960
22148	20072	216.857162	51.374516
22149	20072	14.645936	48.591946
22150	20072	-171.373581	71.650787

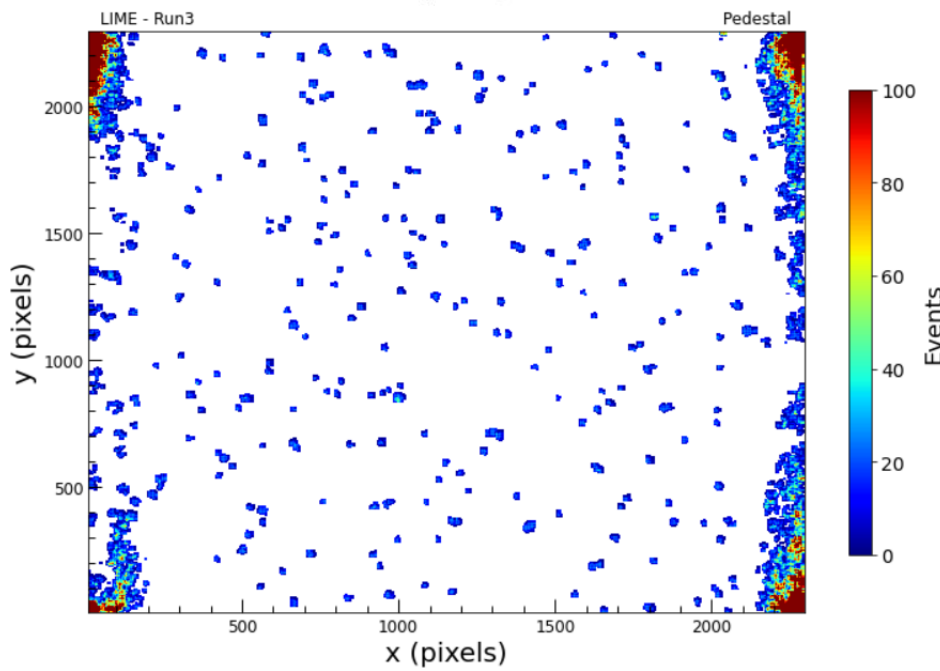
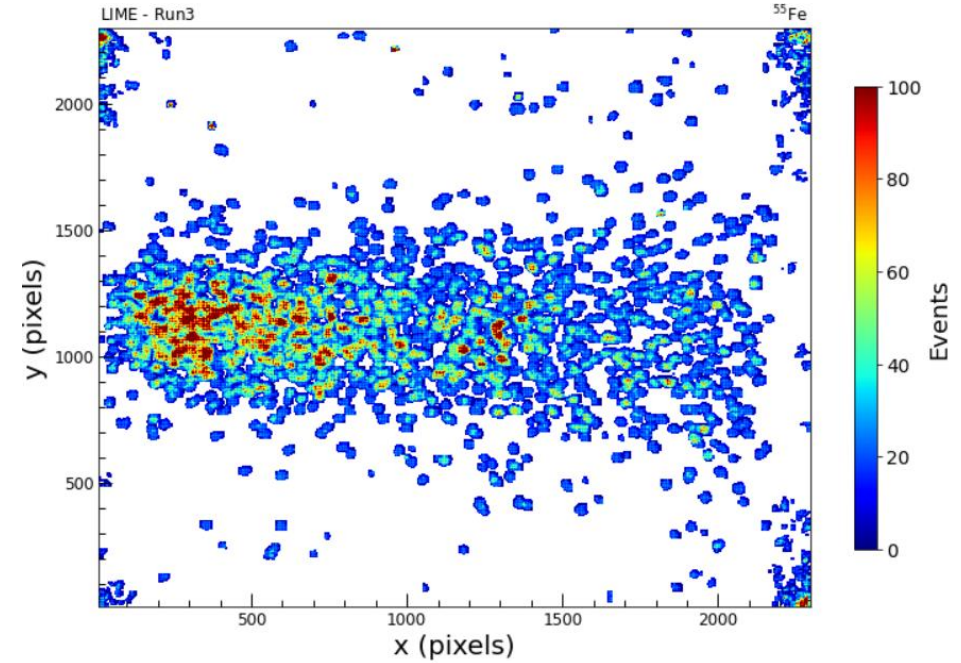
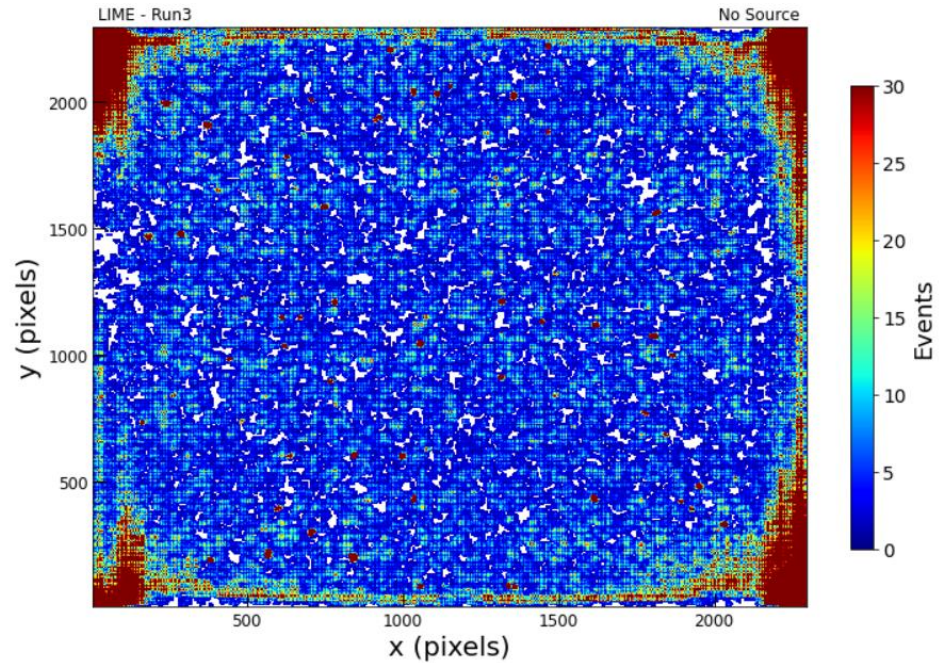
- 431 background runs: 4.37×10^6 clusters
- 62 pedestal runs: 1.61×10^5 clusters
- 2 ⁵⁵Fe runs in step 3 (25 cm): 2.22×10^4 clusters

Length spectrum



Large fake clusters produced by an effect coming from the lateral bands of the sensor?

Clusters occupancy



A higher occupancy at the corners is observed.

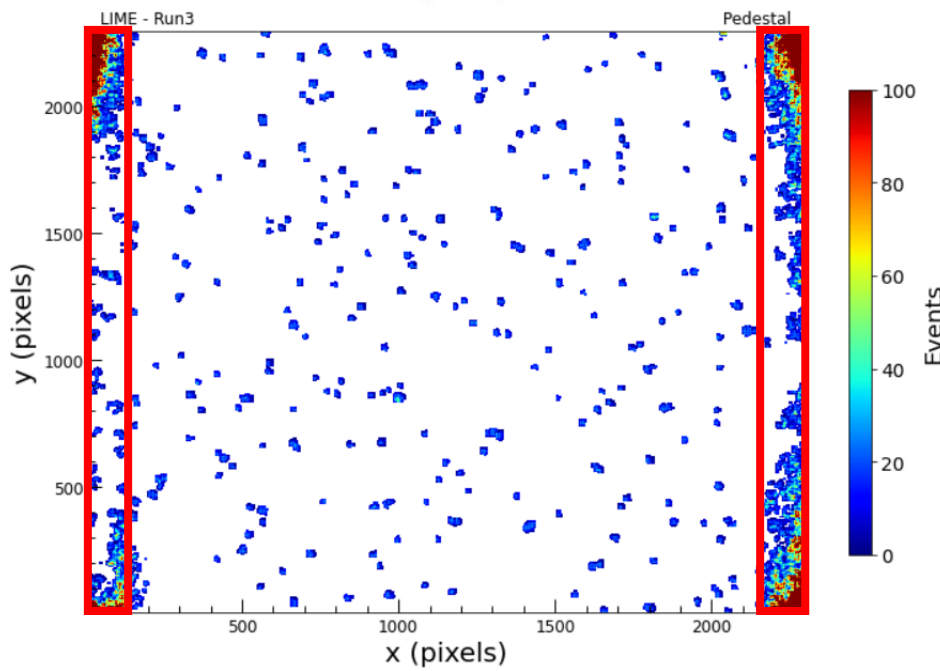
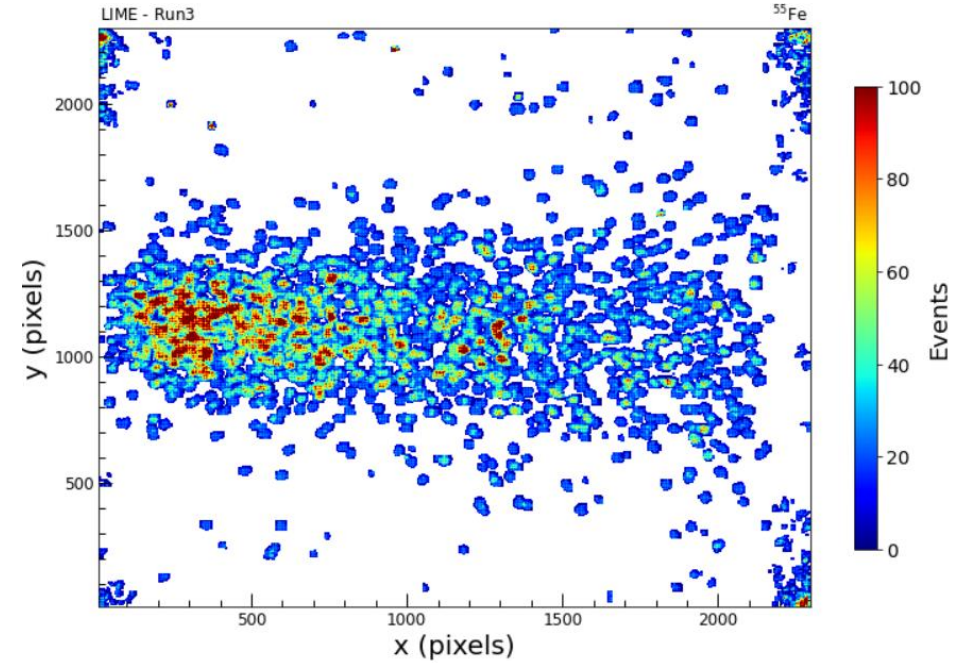
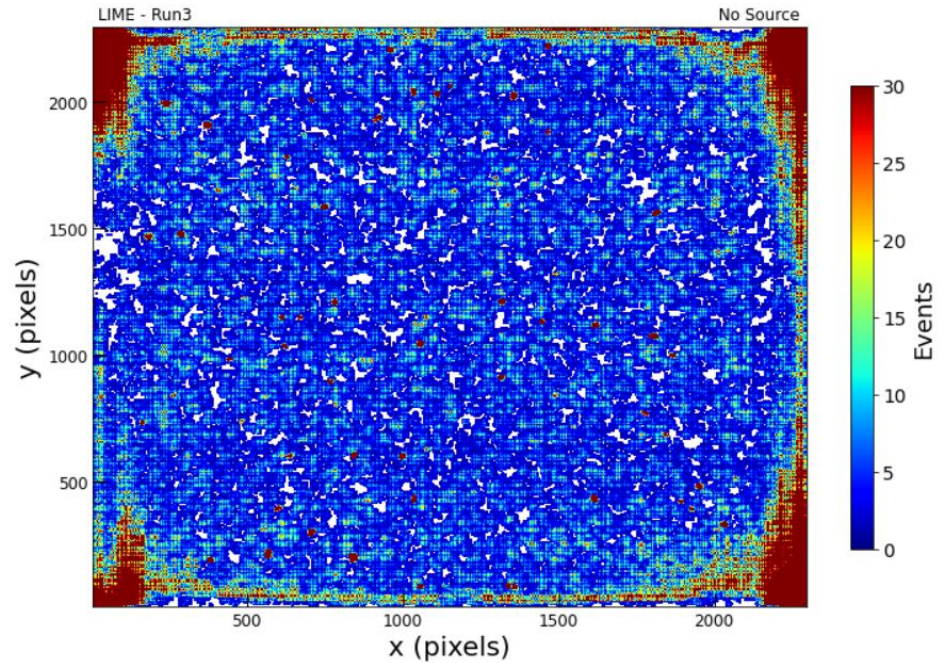
Clusters from the lateral band of the sensor were removed using the following criteria:

"sc_xmin" > 150

&

"sc_xmax" < 2150

Clusters occupancy



A higher occupancy at the corners is observed.

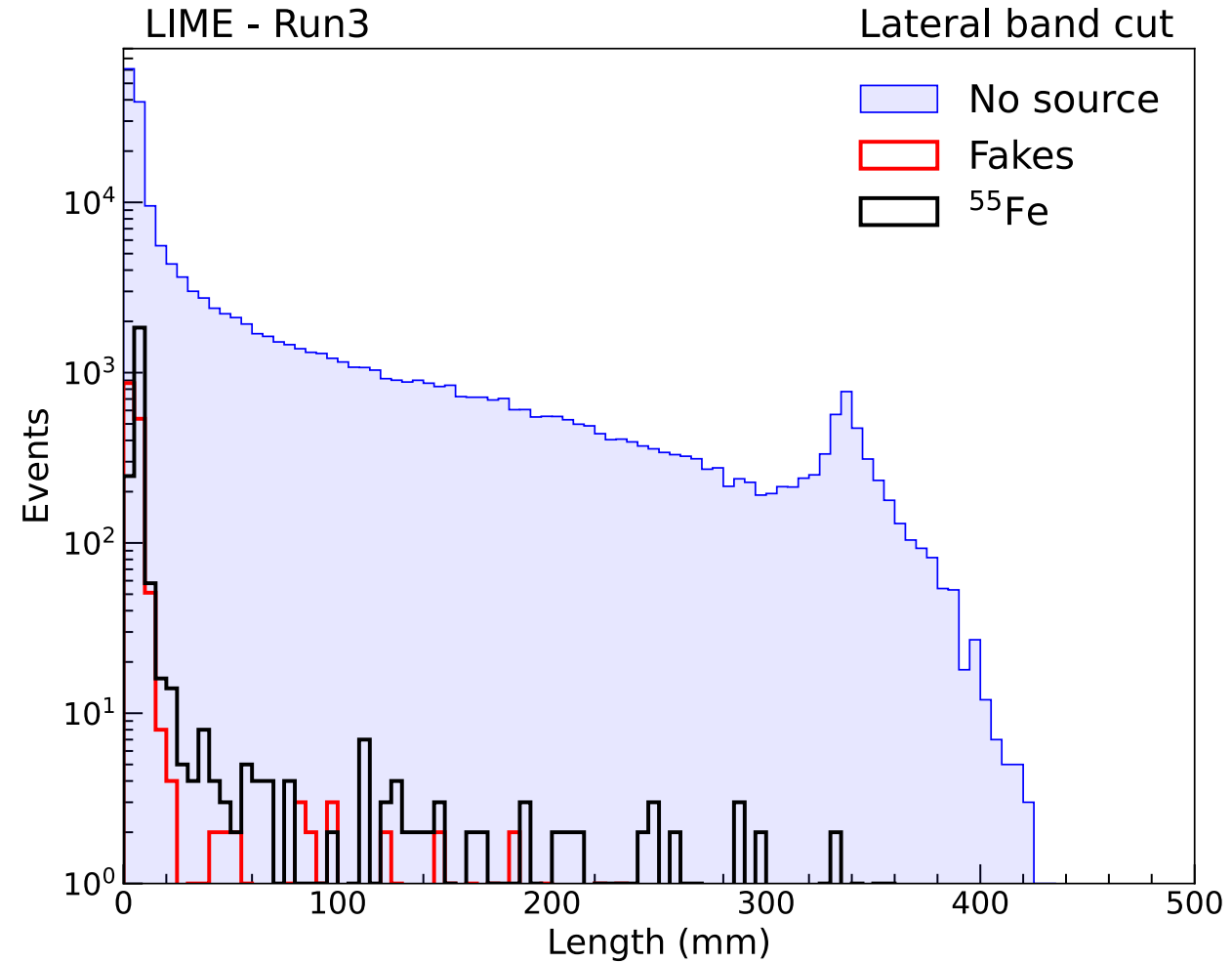
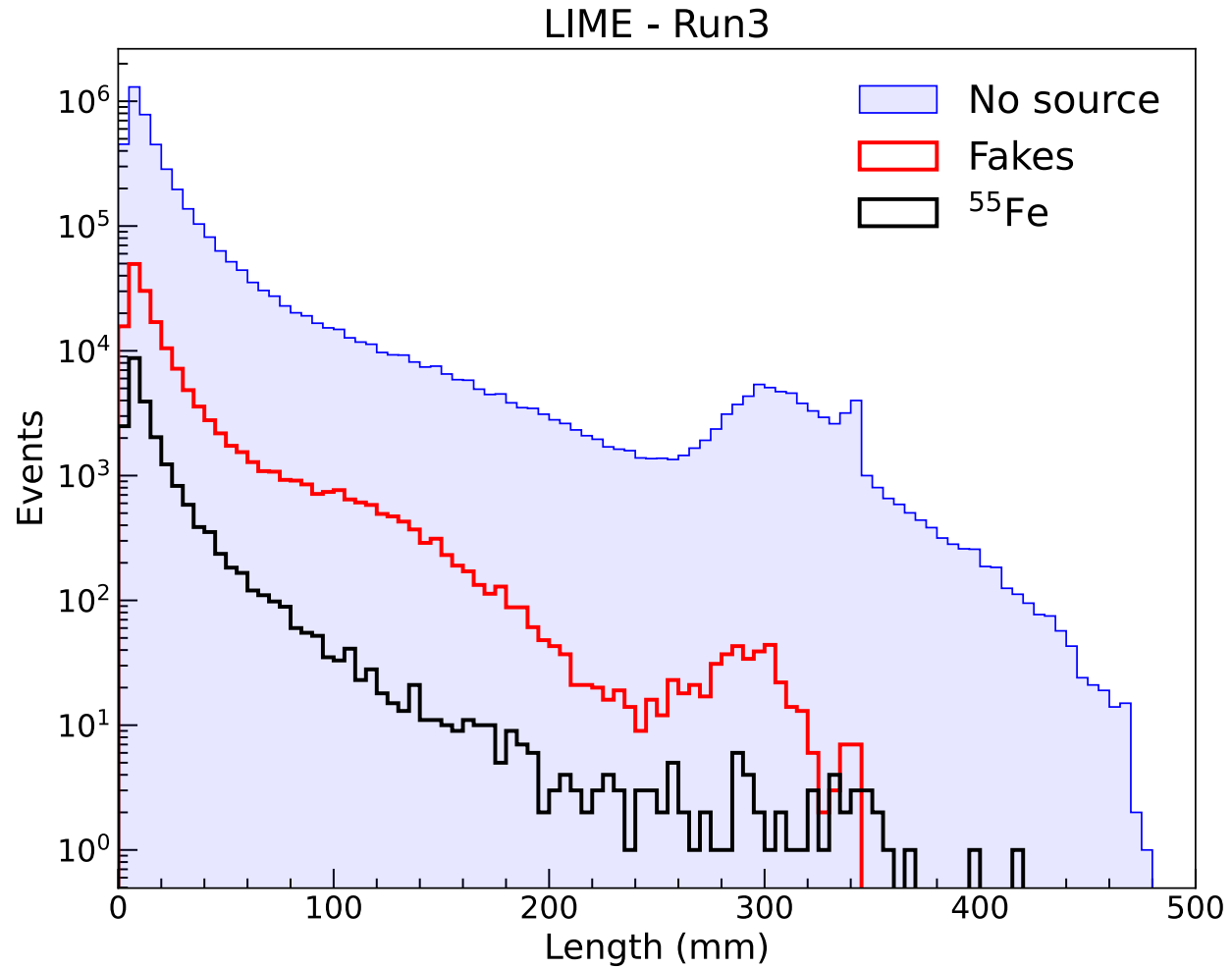
Clusters from the lateral band of the sensor were removed using the following criteria:

"sc_xmin" > 150

&

"sc_xmax" < 2150

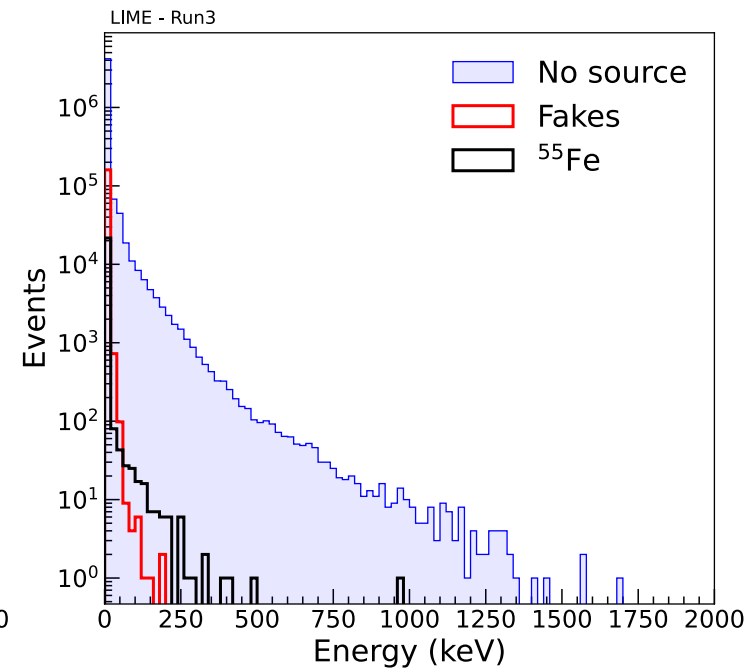
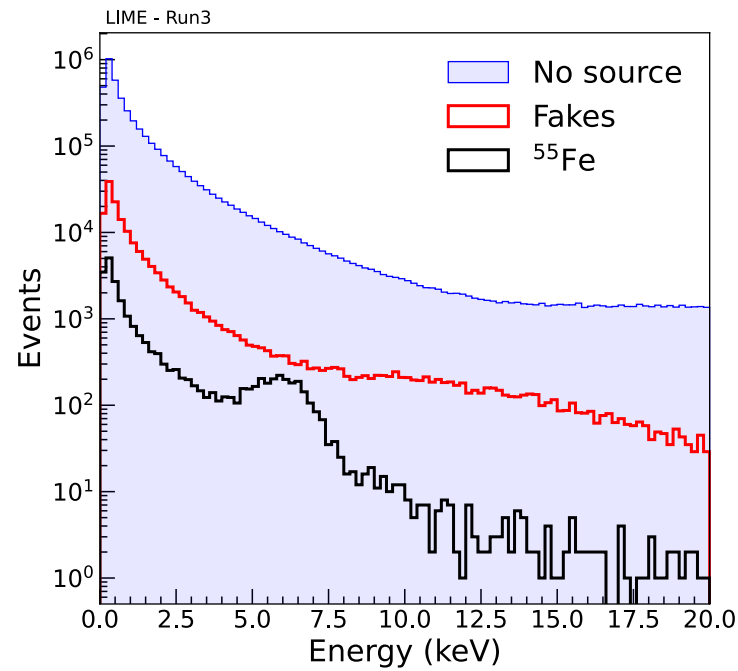
Length spectrum



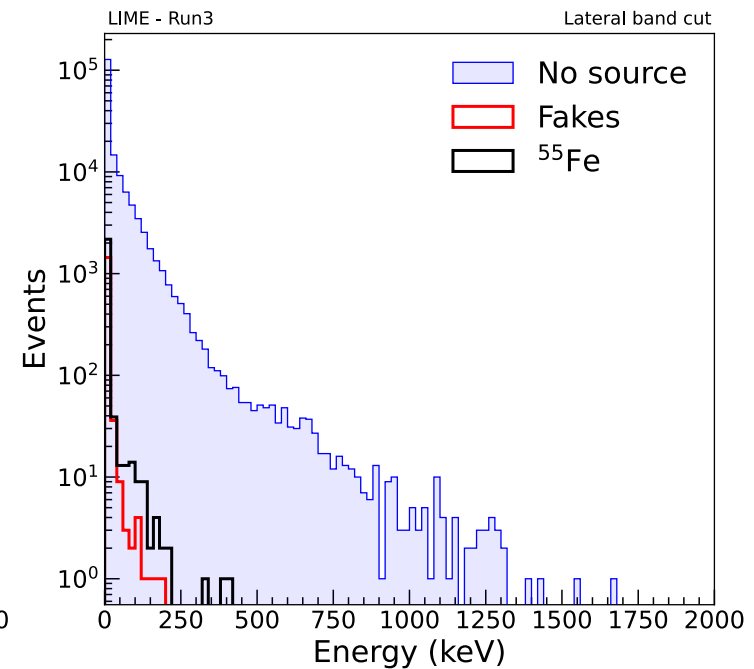
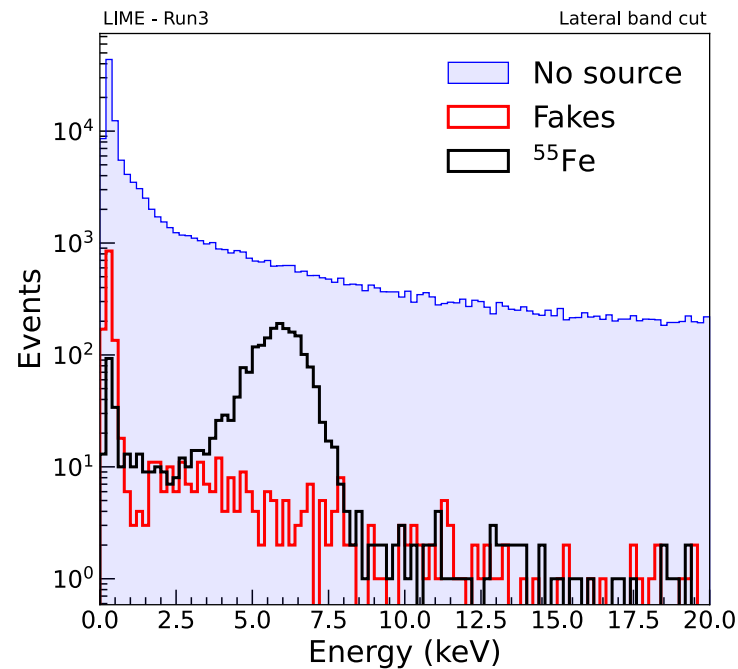
After the cuts, the long "fake tracks" disappeared.

Energy spectrum

Before the cuts

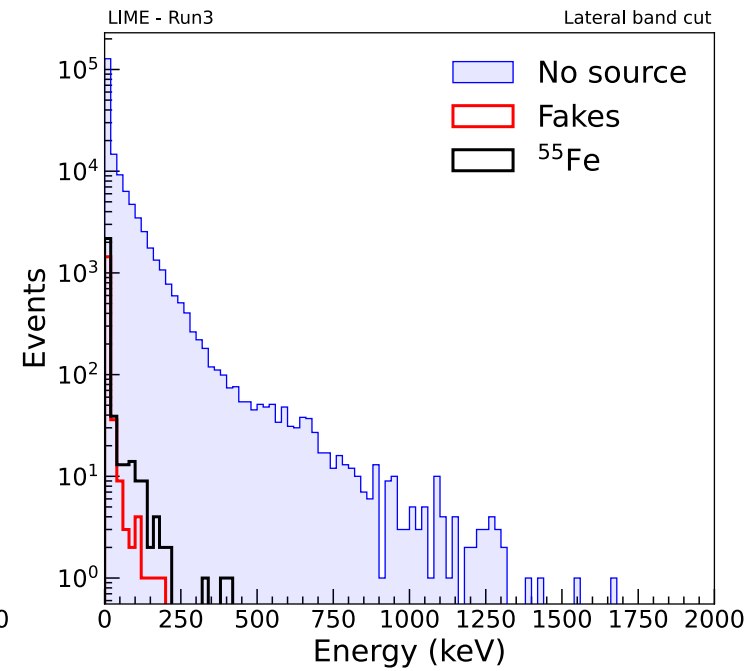
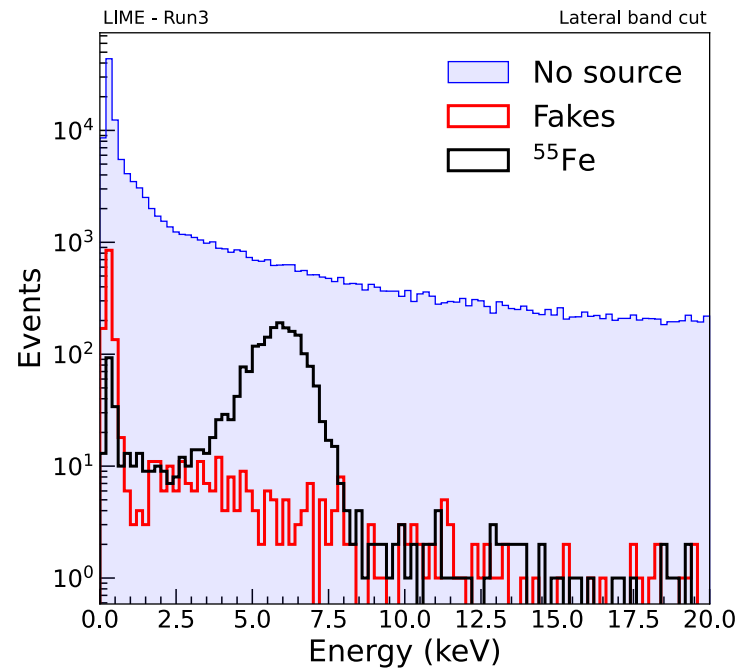


After the cuts

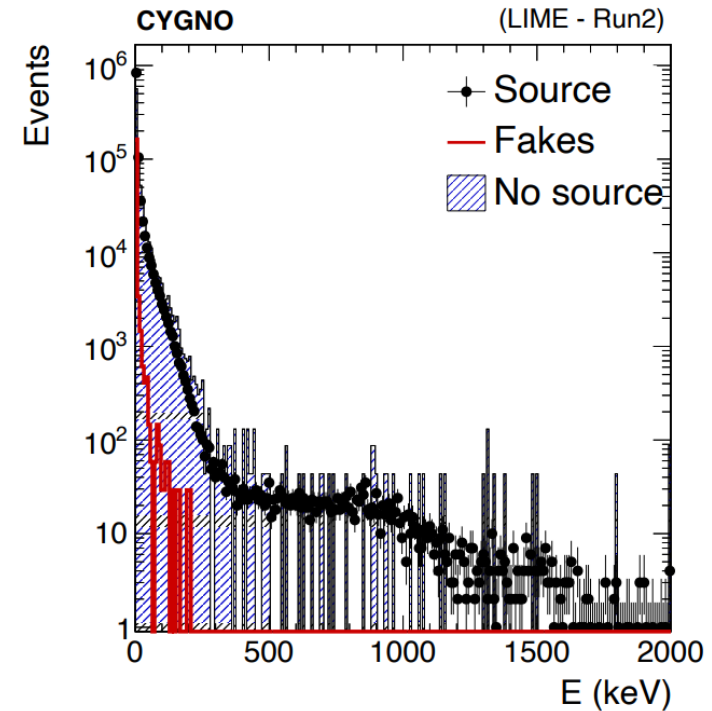
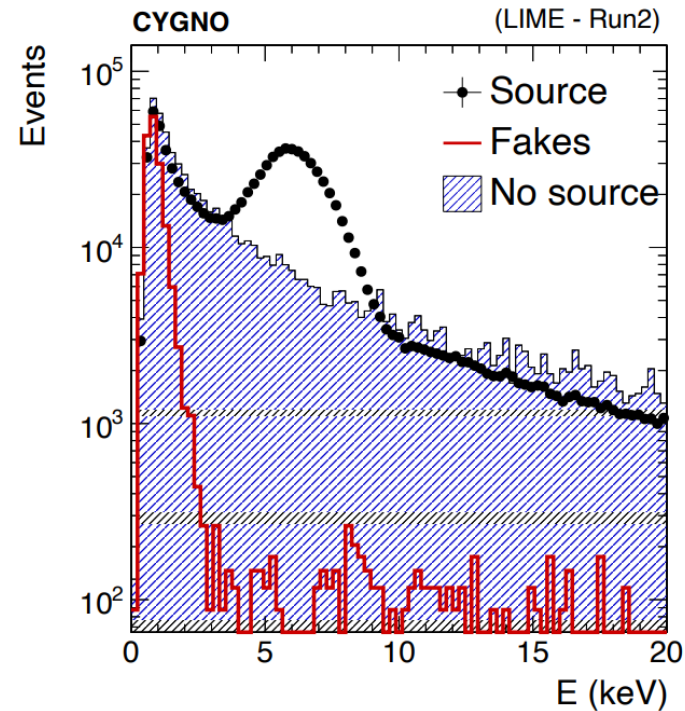


Energy spectrum

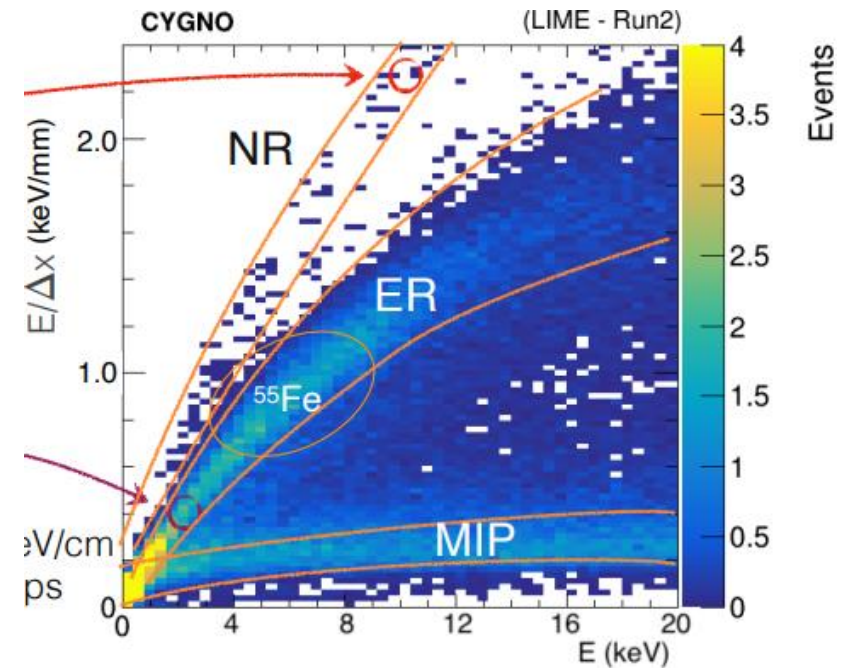
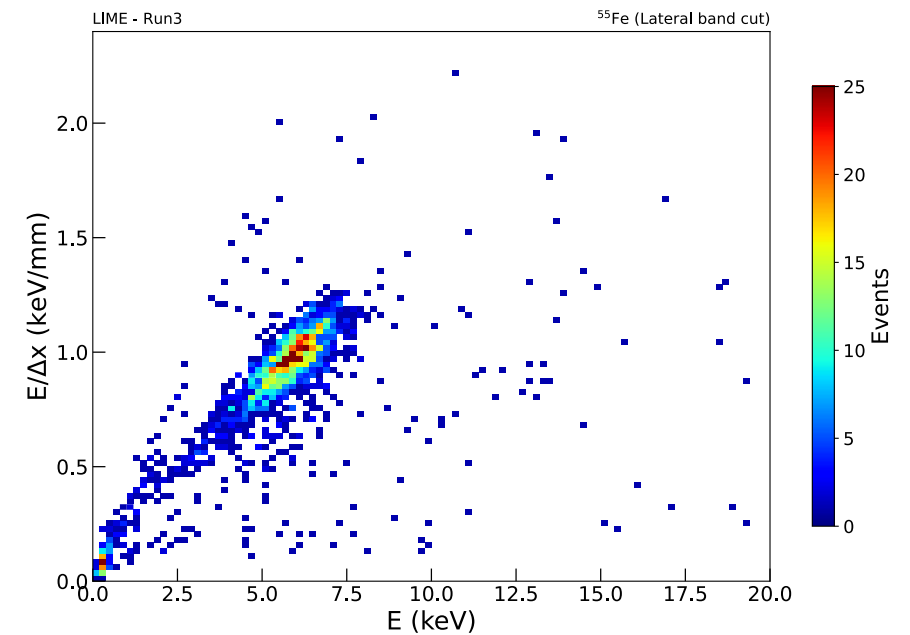
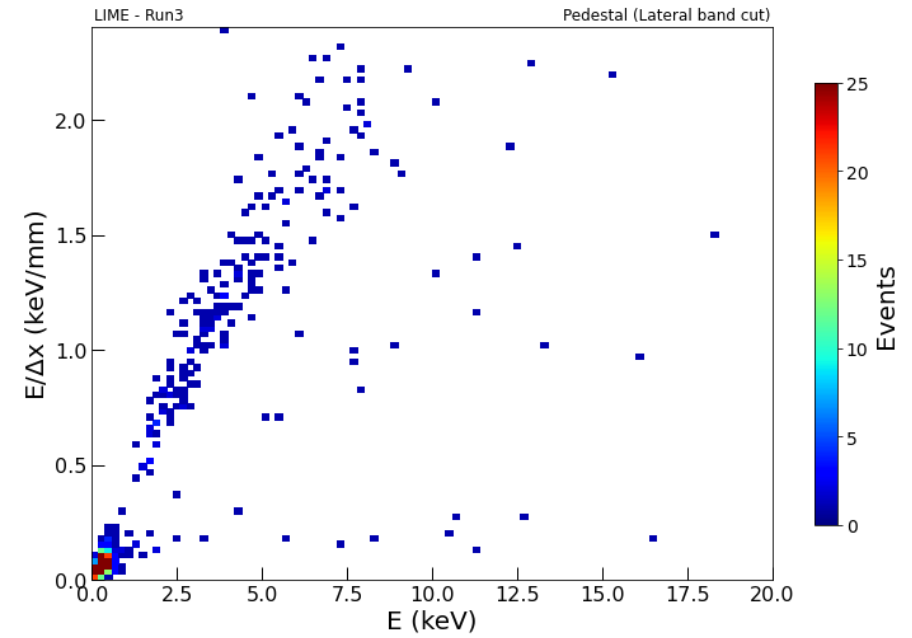
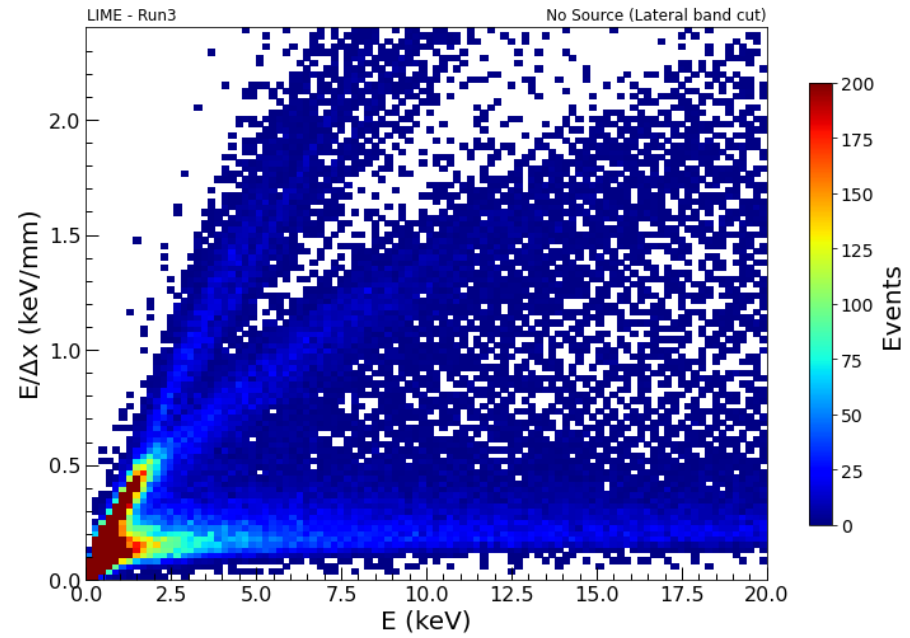
After the cuts



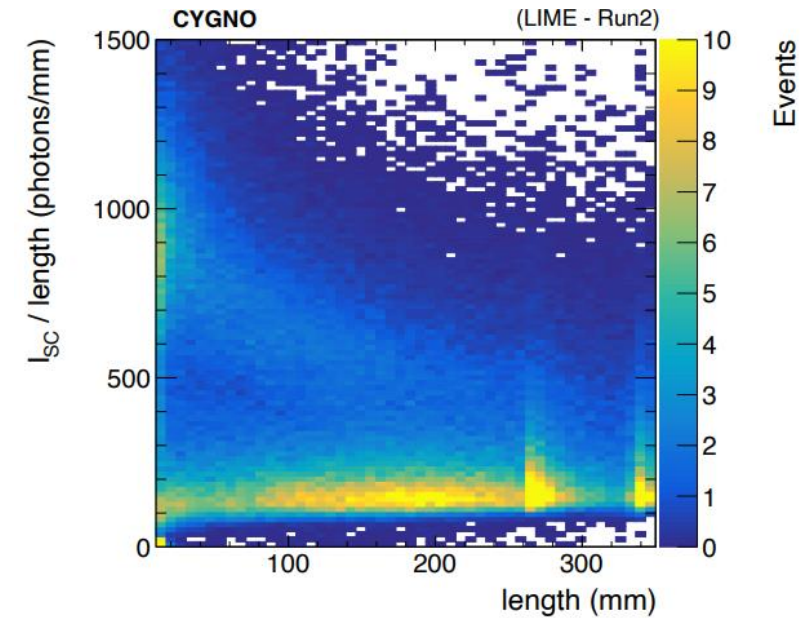
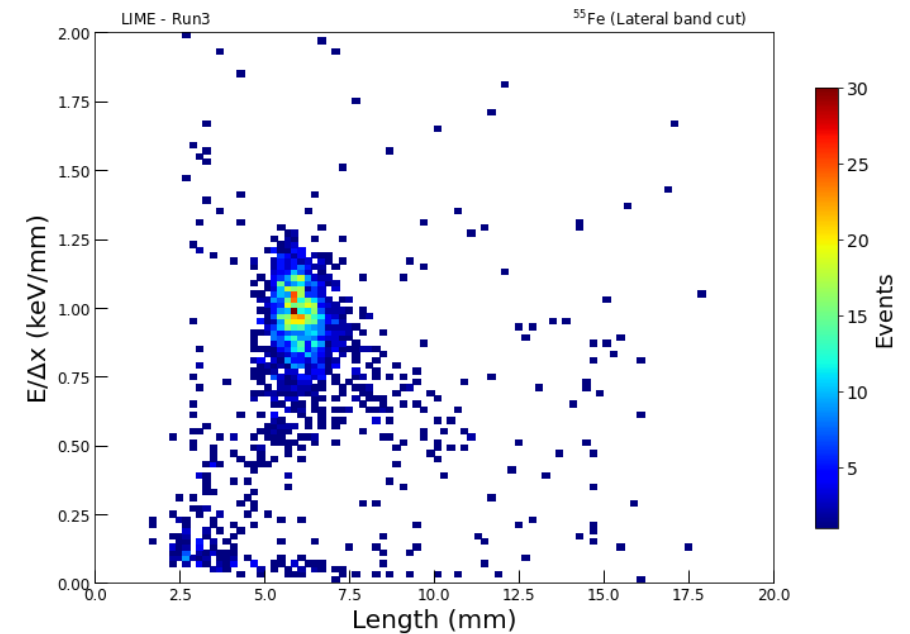
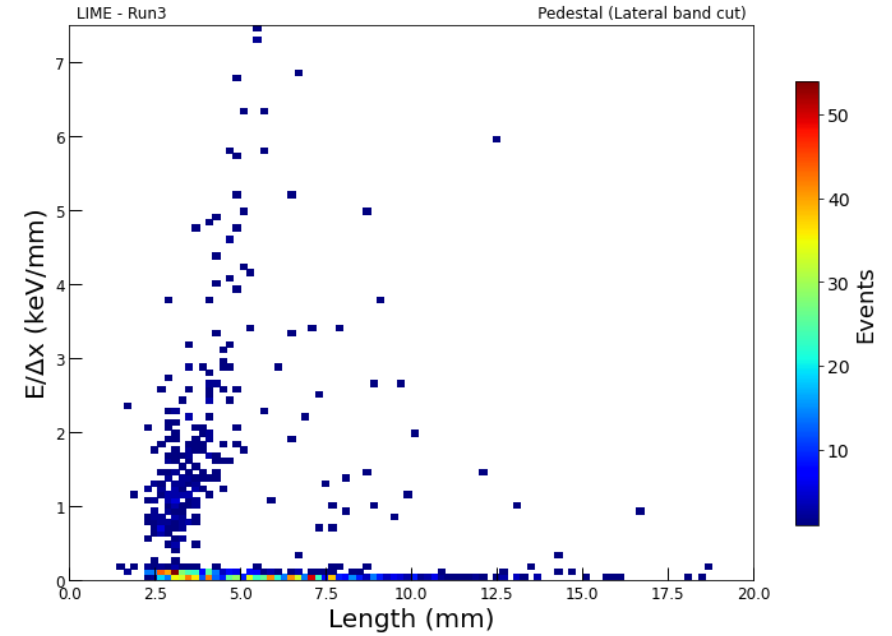
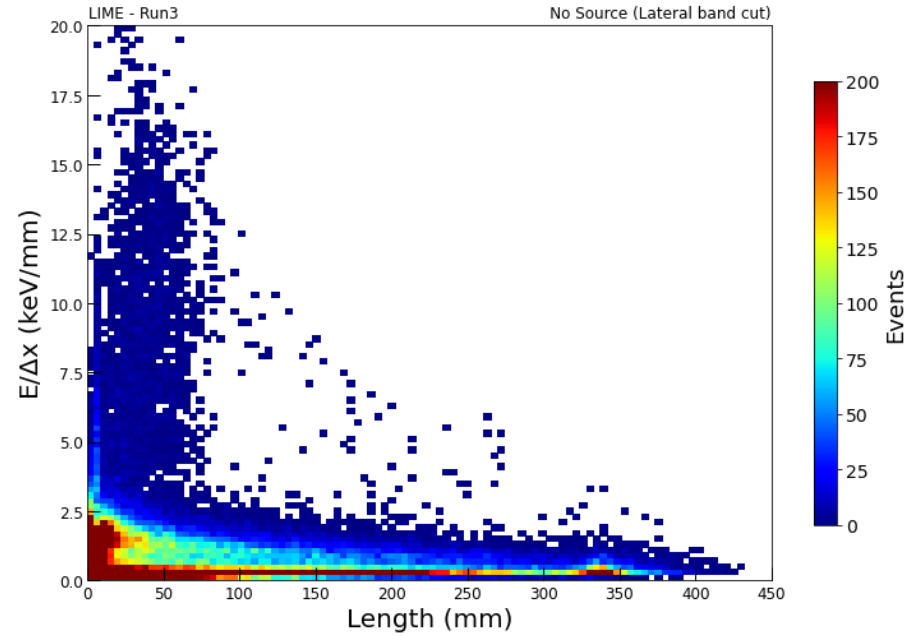
Emanuele's plots



Energy/Length vs Energy



Energy/Length vs Length



Future work
