Run3 equalization

28/03/2024

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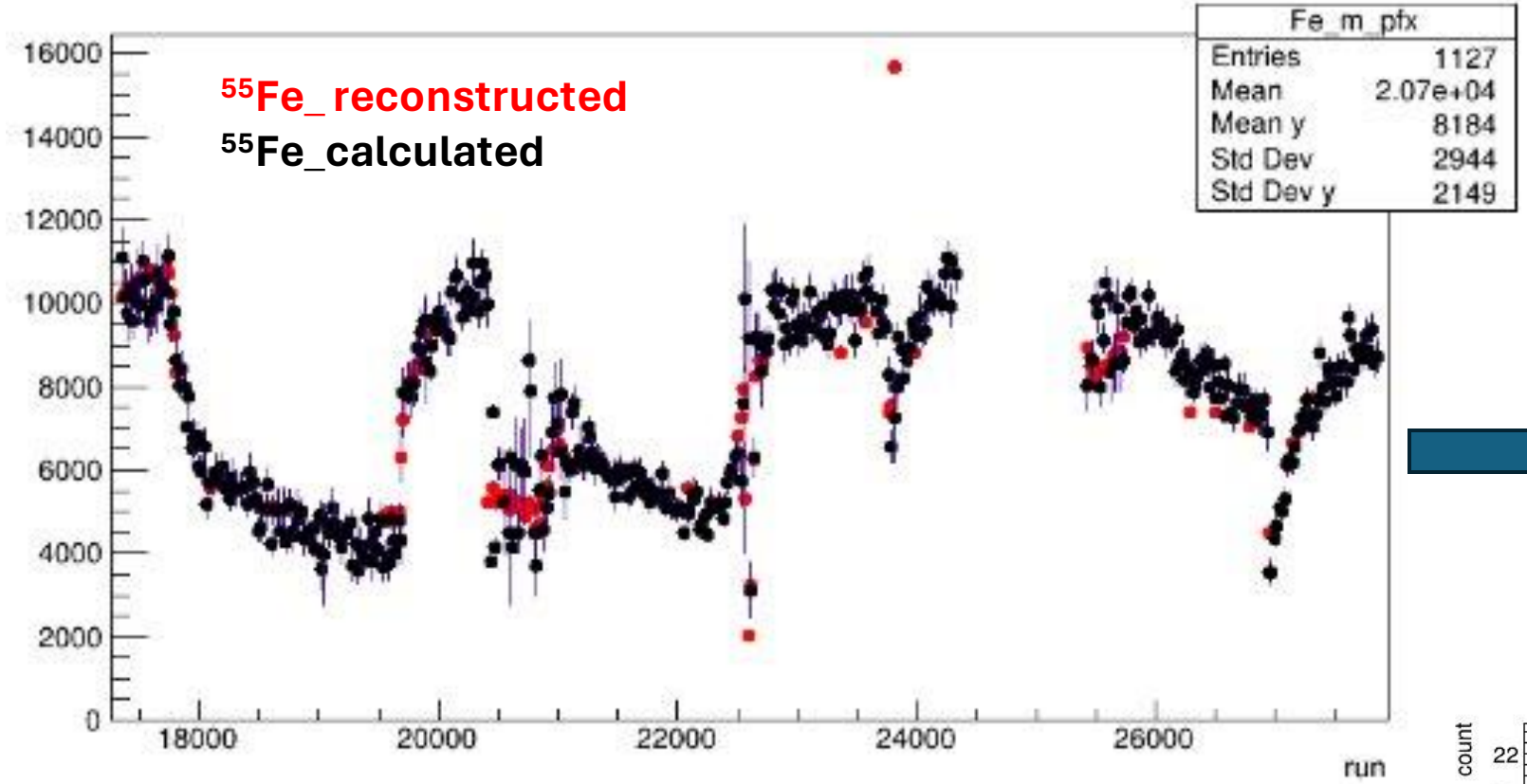


Taking the difference between the reconstructed and the calculated iron peak and dividing per the reconstructed one:

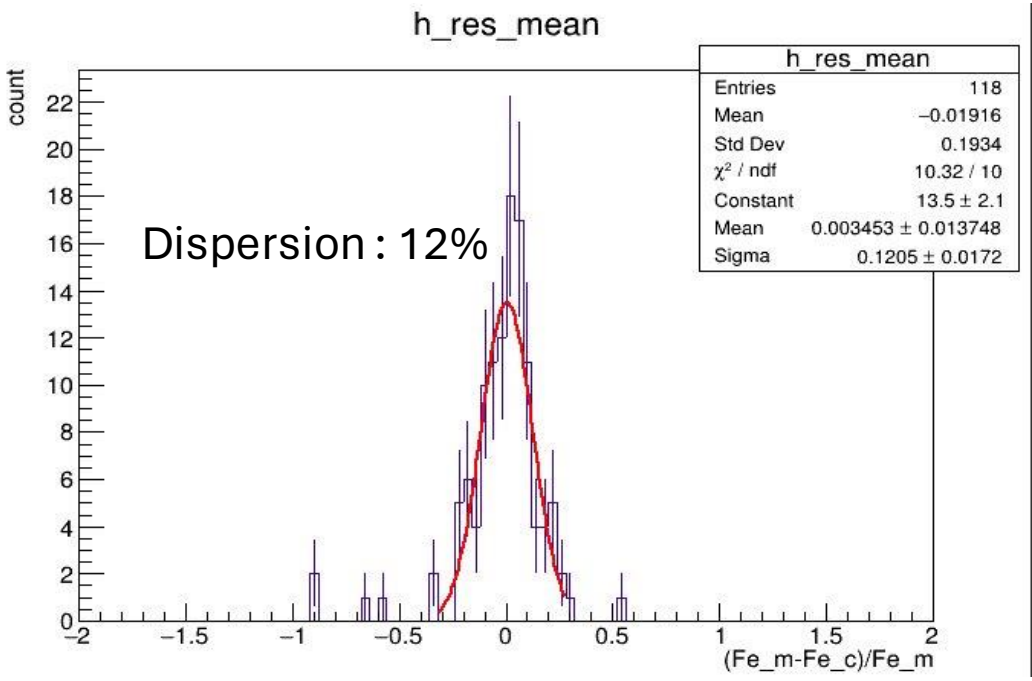


Table:

link to download the table and the instruction to use it

Run	Fe_peak	Corr	Evaluated
17363	10190.5978879543	10190.5978879543	11100
17364	9963.14914219107	9963.14914219107	11100
17365	10013.0770133558	10013.0770133558	11100
17366	10271.4122962941	10271.4122962941	11100
17368	10155.1950635801	10155.1950635801	11100
17369	10265.0314082141	10265.0314082141	11100

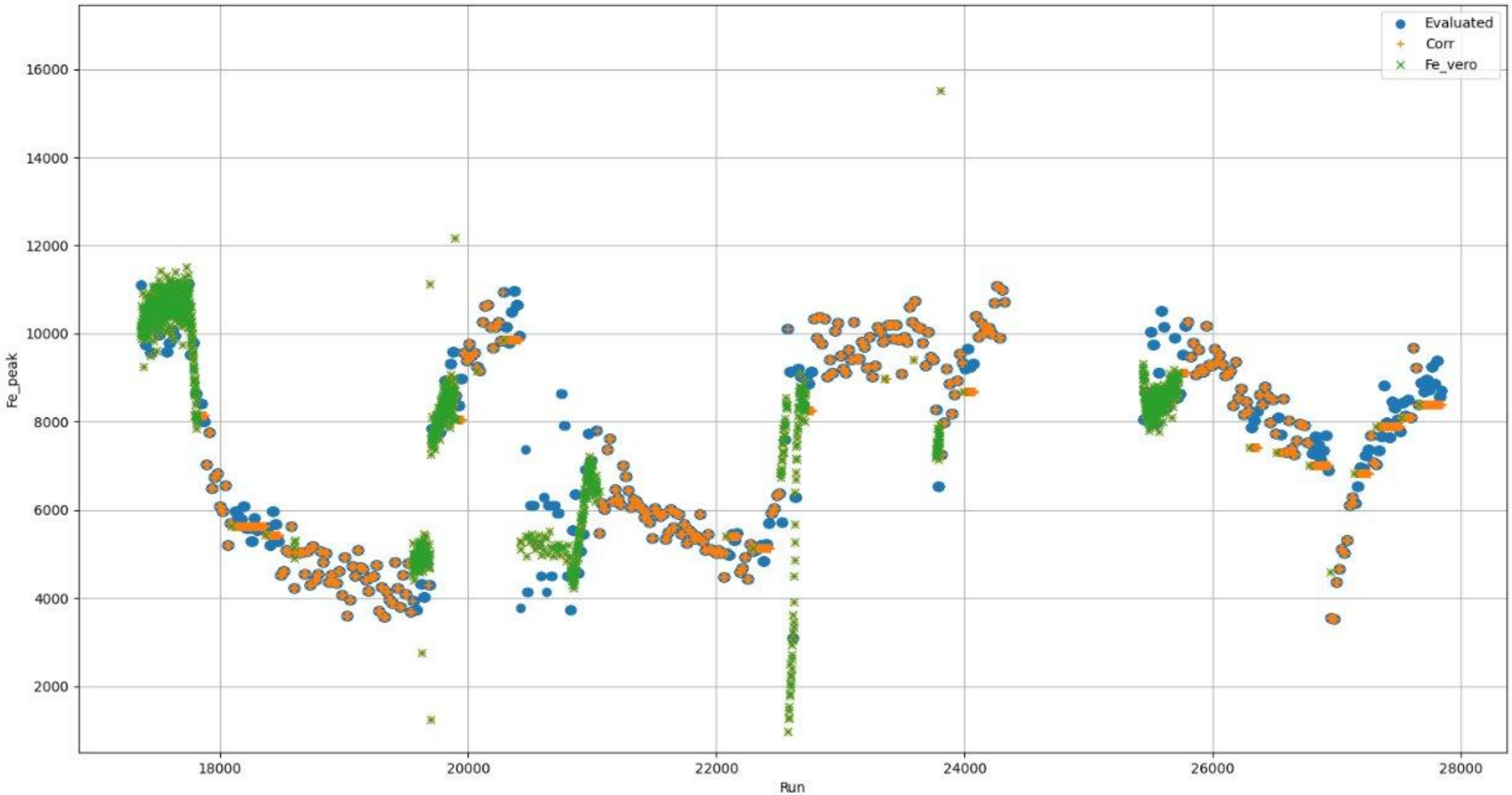
Run = run number

Fe_peak = if the source is at step 3 --> iron peak evaluated fitting the sc_integral distributions
If there is not the source or the position is different from the step 3 --> 0

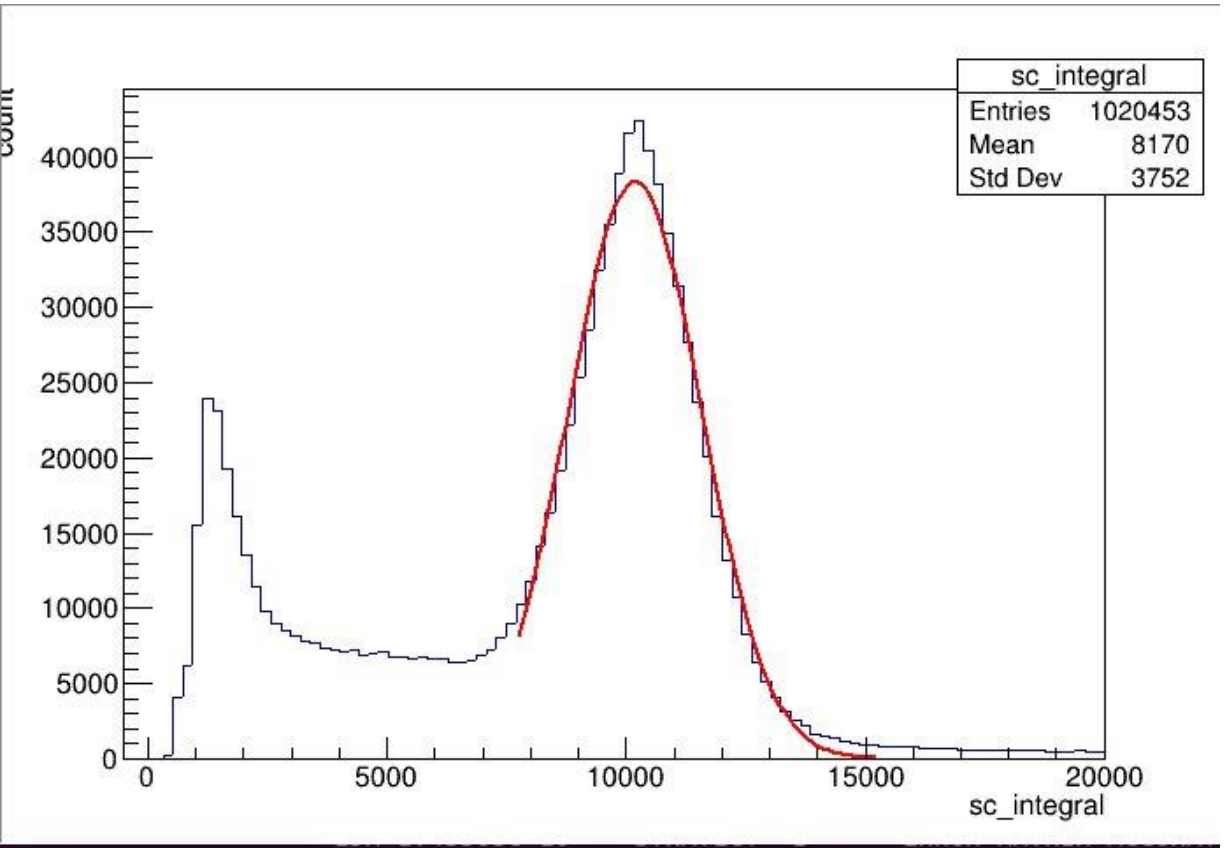
Corr = Fe_peak if the source is at step3
if Fe_peak = 0 --> I take the last iron peak value, if the difference from the evalueated is less than the 12%, corr is setted egual to the last Fe_peak value, otherwise egual to the evaluated value. Starting from here, it is setted always egual to the evaluated

Evaluated = iron peak evaluated using LY_30

Plot of the table



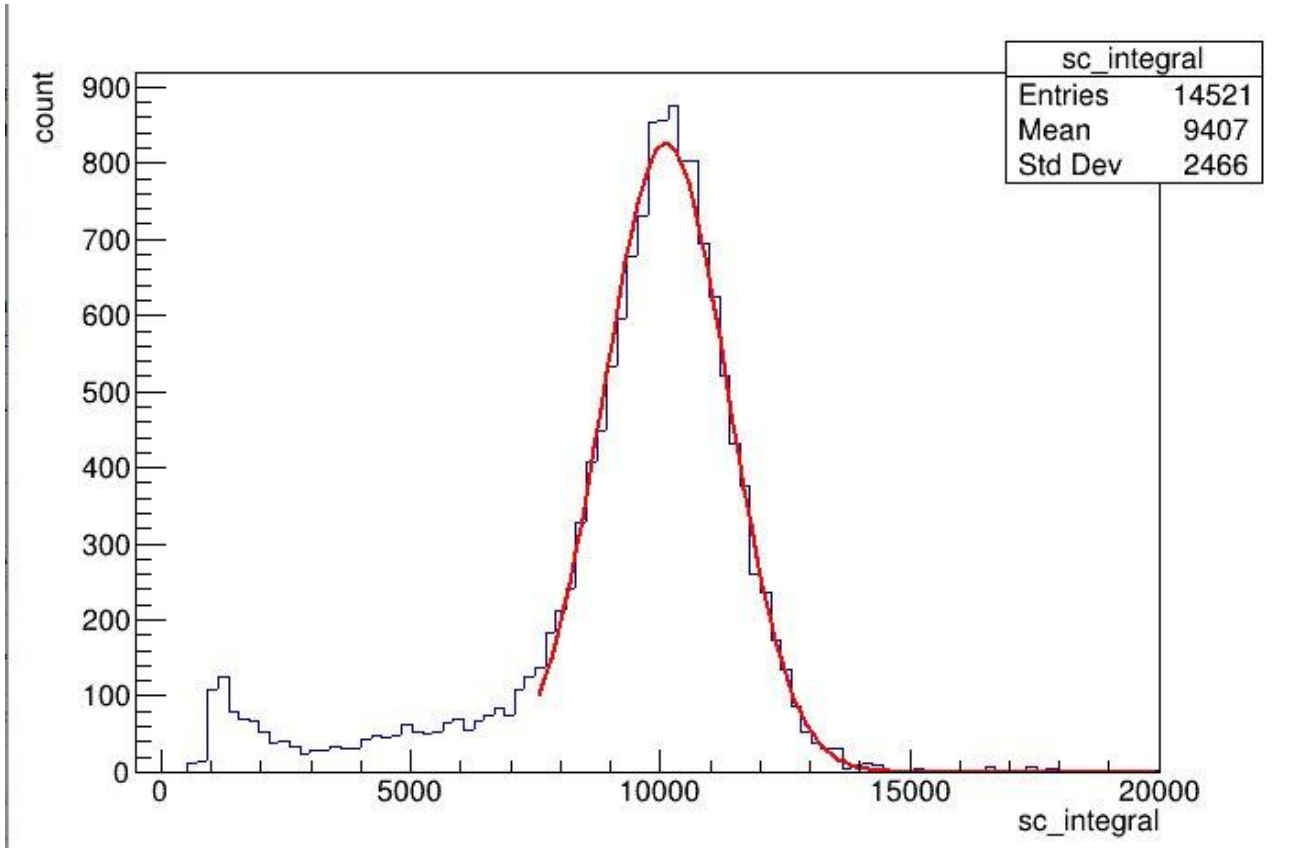
All the runs are equalised



EXT NO.	PARAMETER NAME	VALUE	ERROR	STEP SIZE	FIRST DERIVATIVE
1	Constant	3.83778e+04	6.56320e+01	2.06884e+00	-6.27331e-09
2	Mean	1.01833e+04	2.00760e+00	8.13193e-02	1.12052e-06
3	Sigma	1.38938e+03	1.94082e+00	1.44881e-05	3.60228e-02

```
>>>
>>> 1389/10183
0.136403810272022
```

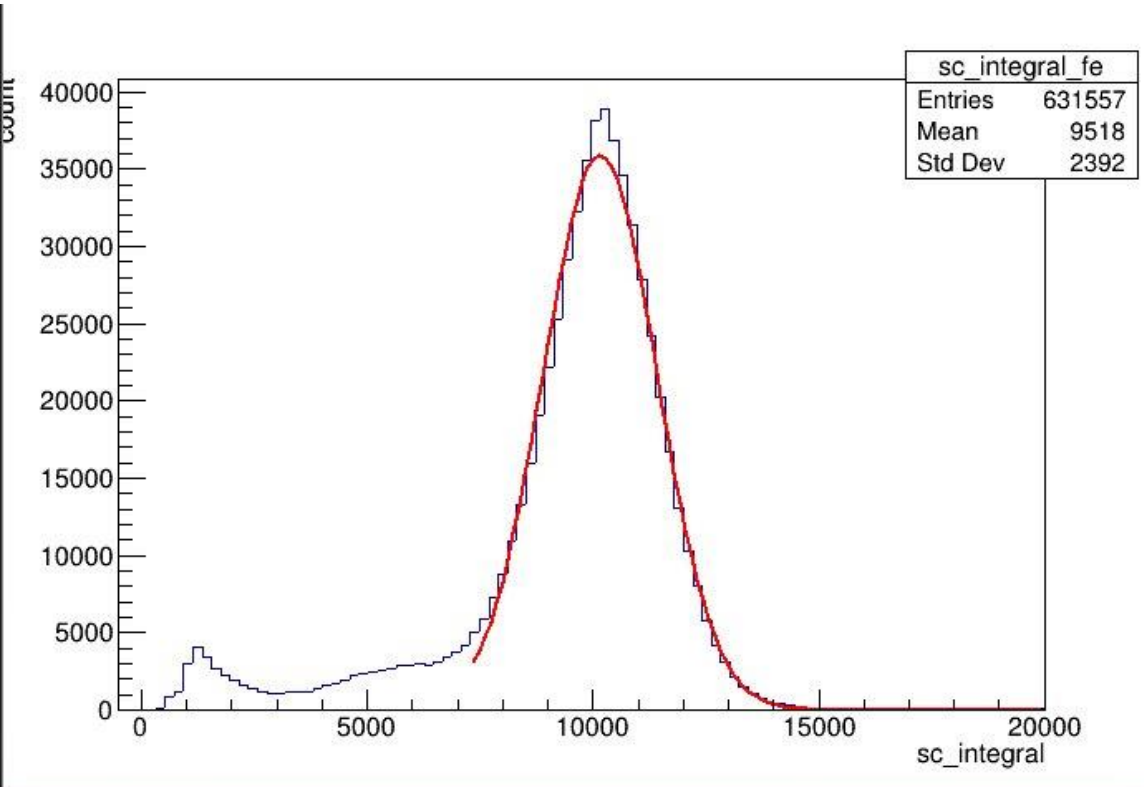
All the calibration runs at step3 are equalised



NO.	NAME	VALUE	ERROR	SIZE	DERIVATIVE
1	Constant	8.26423e+02	9.48859e+00	4.03906e-02	5.57308e-09
2	Mean	1.01132e+04	1.22711e+01	6.38260e-02	4.05390e-08
3	Sigma	1.24360e+03	9.92820e+00	1.08326e-05	-1.58509e-03

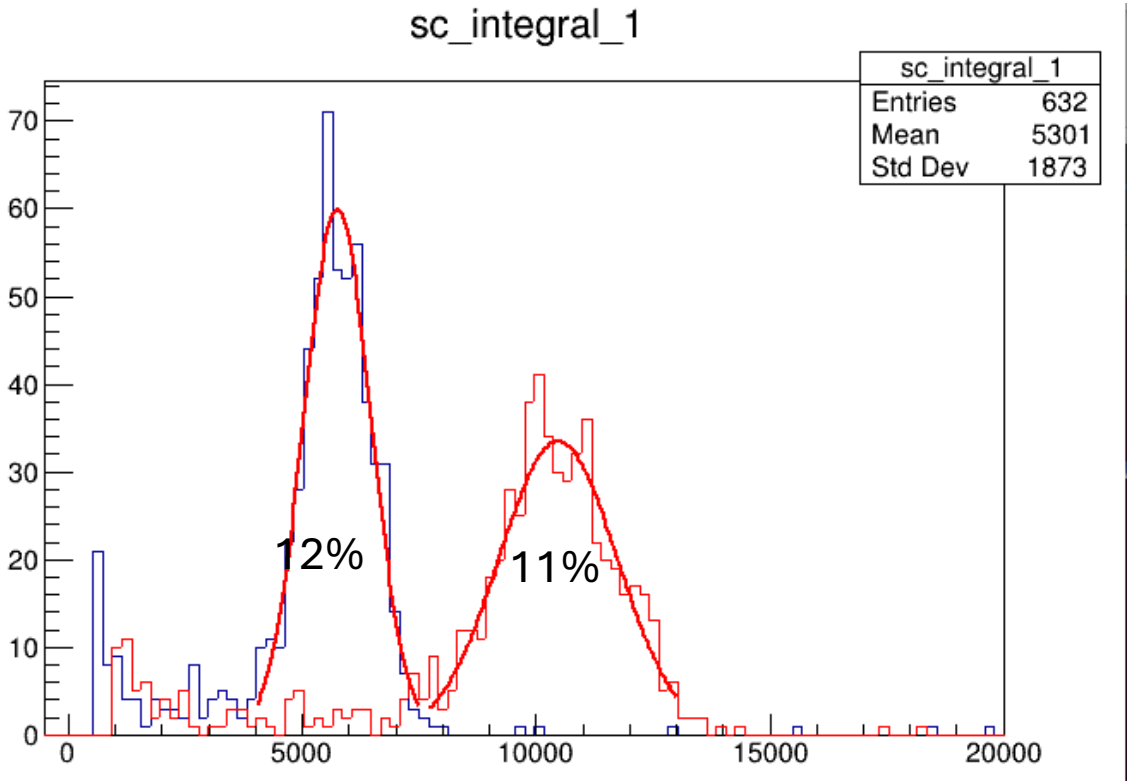
```
>>> 1243/10113
0.12291110451893603
>>>
```

All the runs with the source at step3 are equalised



EXT NO.	PARAMETER NAME	VALUE	ERROR	STEP SIZE	FIRST DERIVATIVE
1	Constant	3.58809e+04	6.28187e+01	1.69294e+00	3.76734e-06
2	Mean	1.01564e+04	1.82352e+00	6.18188e-02	-1.71940e-04
3	Sigma	1.26368e+03	1.52589e+00	1.04208e-05	-2.95455e-01

```
>>> 1263/10156
0.12435998424576605
>>>
```




```
 EXT PARAMETER                                   STEP         FIRST
 NO.   NAME      VALUE            ERROR          SIZE      DERIVATIVE
  1  Constant     5.99150e+01   3.36958e+00   5.03505e-03  -1.19318e-04
  2  Mean         5.74720e+03   3.34949e+01   6.37497e-02  -7.77895e-07
  3  Sigma        7.18705e+02   2.81480e+01   1.97956e-05  -3.80121e-02
 FitEditor::DoFit - using function PrevFitTMP  0xbc2b640
```

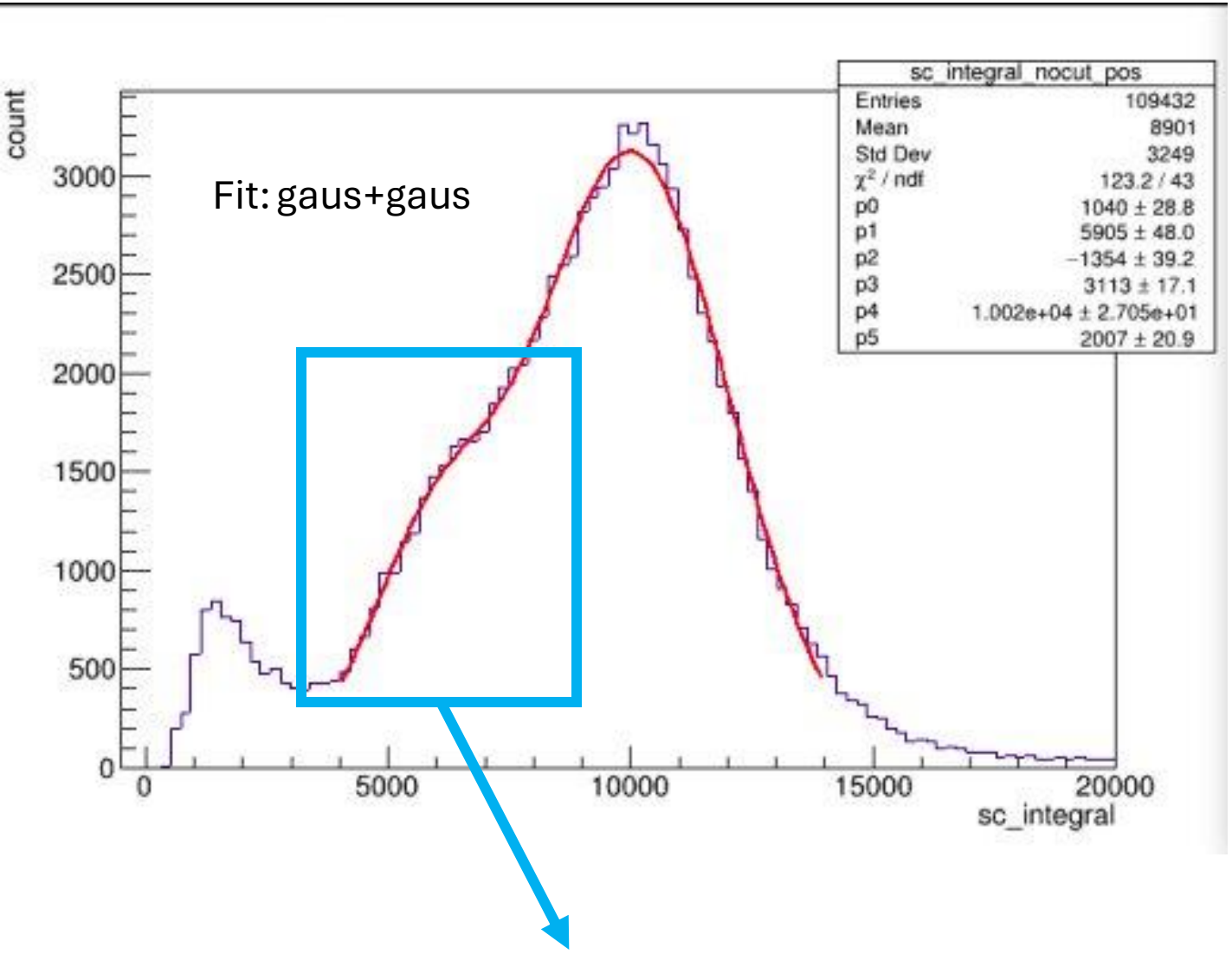
```
                  EDM=2.05138e-08    STRATEGY= 1      ERROR MATRIX ACCURAT
 EXT PARAMETER                                   STEP         FIRST
 NO.   NAME      VALUE            ERROR          SIZE      DERIVATIVE
  1  Constant     3.35218e+01   1.98085e+00   3.35252e-03  -6.30872e-05
  2  Mean         1.04676e+04   6.34323e+01   1.39128e-01   8.09289e-07
  3  Sigma        1.25587e+03   5.94766e+01   2.75999e-05   4.94985e-03
```

One calibration run with iron source at step3 (run 18096):

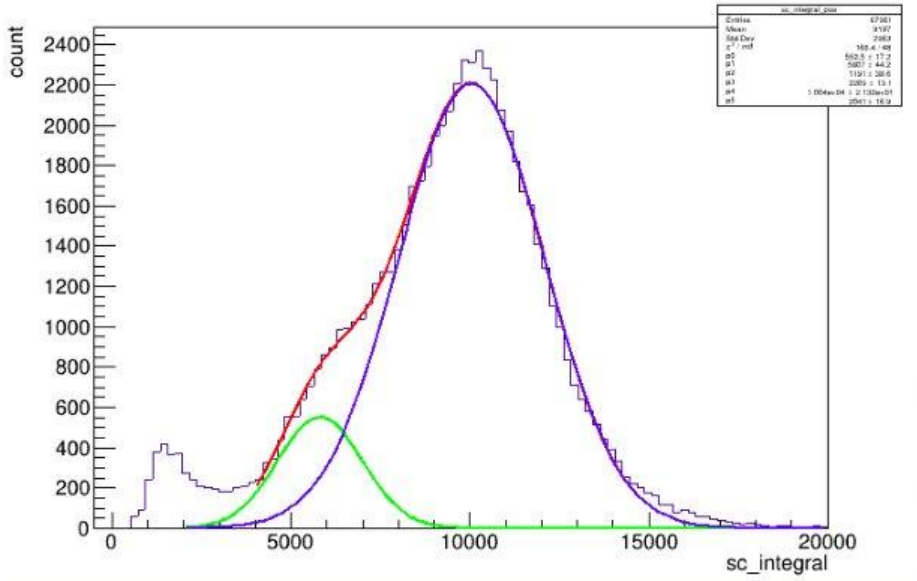
Original distribution (resolution 12%)

Equilized distribution (resolution 11%)

All the calibration runs at different step



Due to the saturation

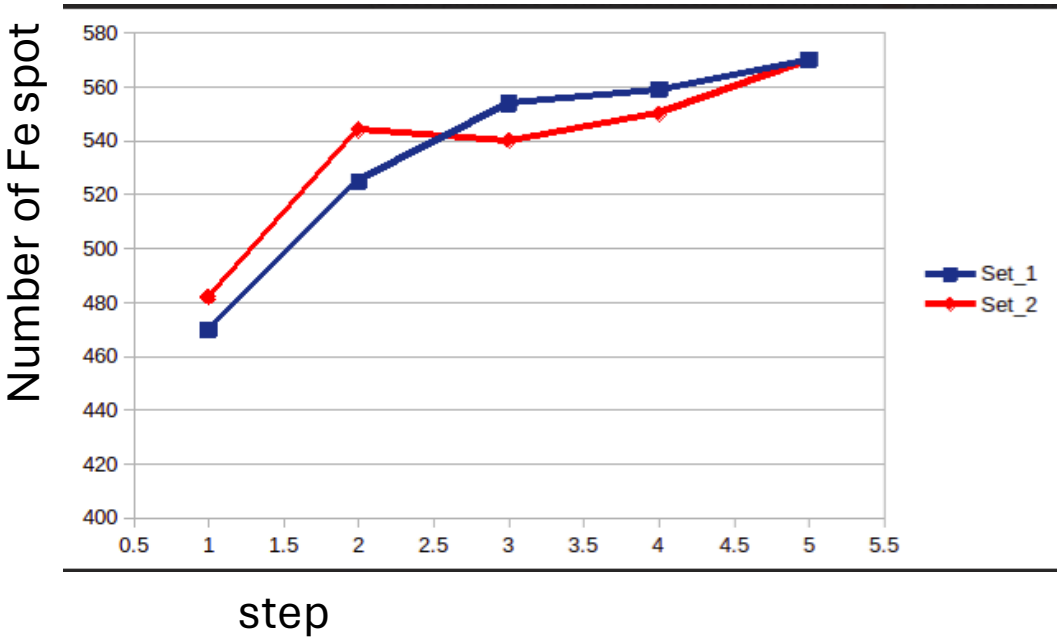


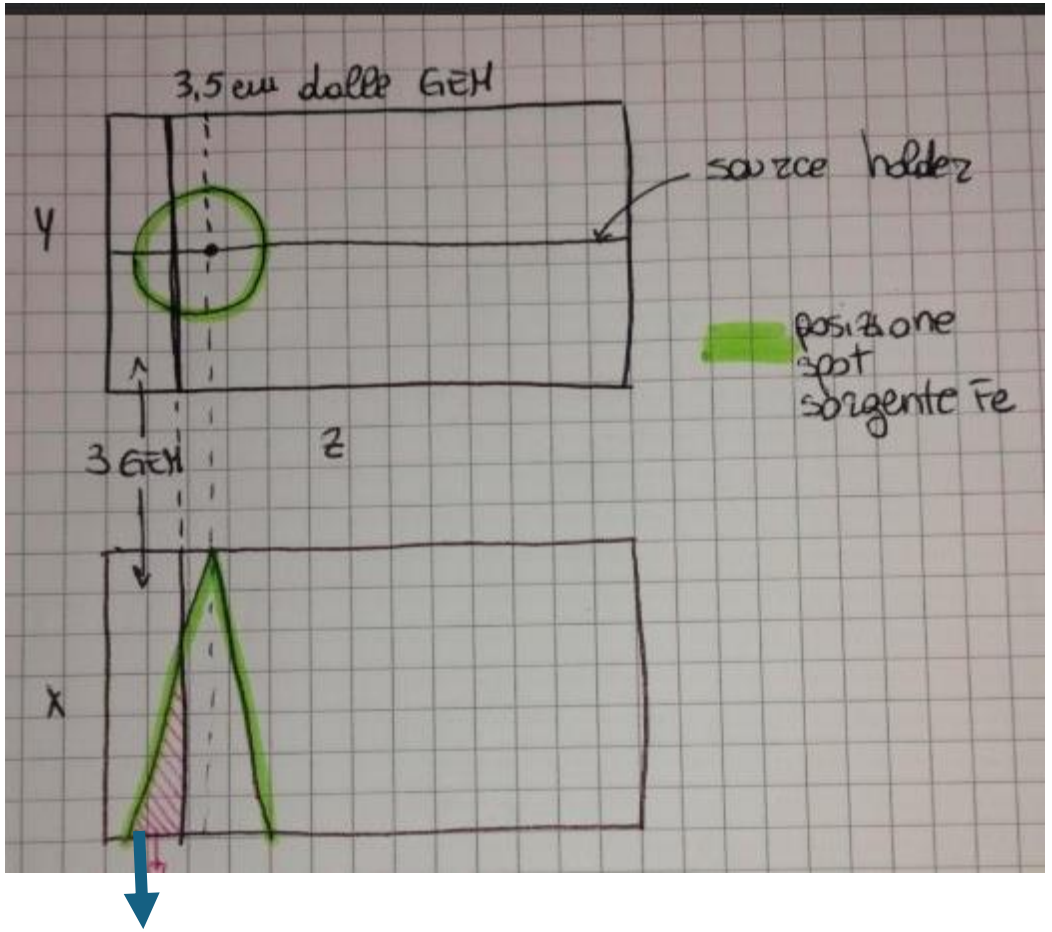
Green = contribution given by the step1
Blu = contribution given by step2, 3, 4, 5

It is expected that the blu gassian area should be 4 times the green one
But: blu gassian area = 7 green gaussian area

How many spot at each step?

I took 2 set of calibration, evalueting the numer of iron spot, I found:

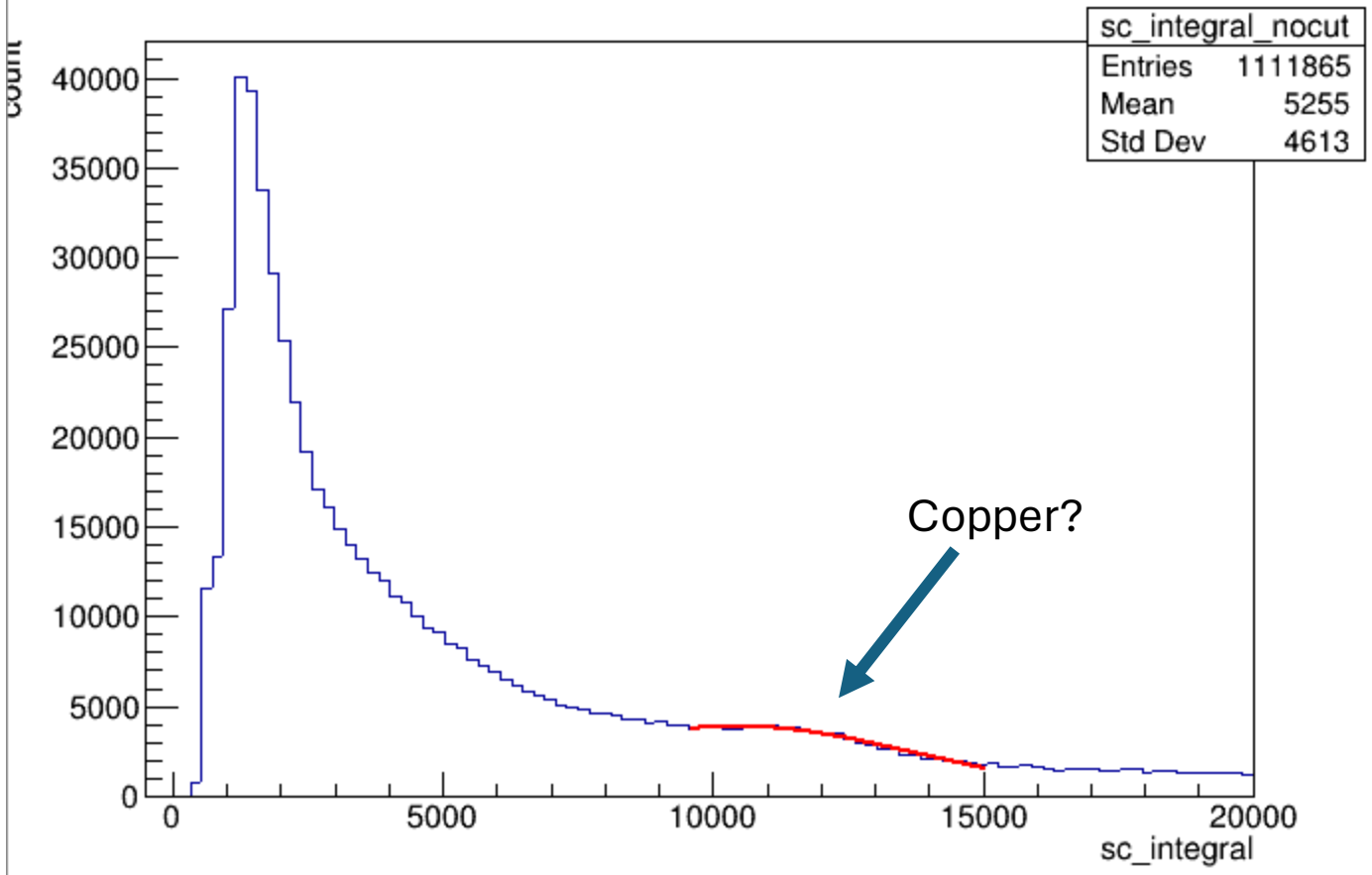




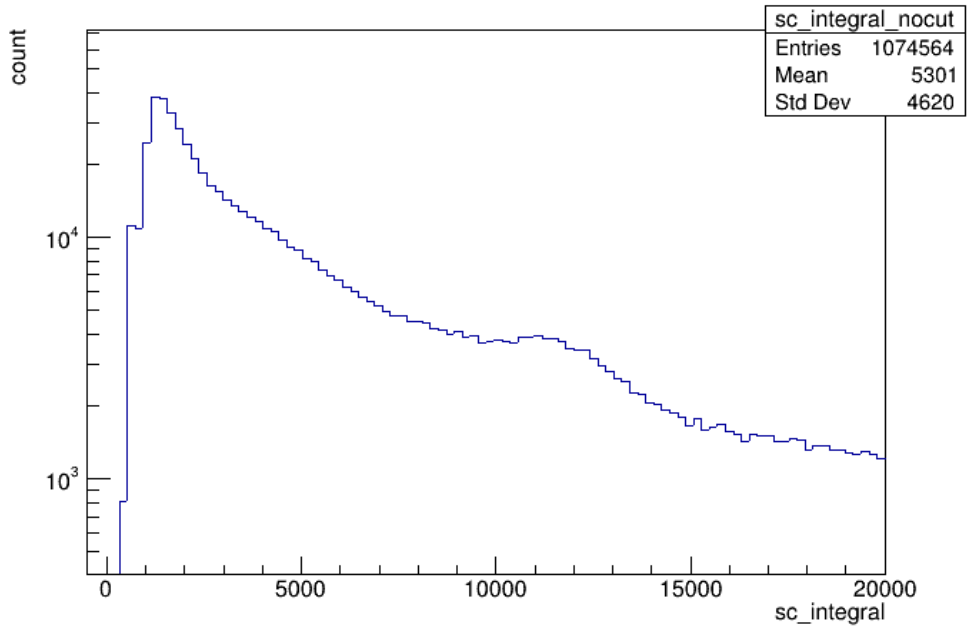
Maybe when the source is at step1, some spot happens in the GEMs area

All the runs without the iron source equalised

Cuts: fiducial area & noise



EXT NO.	PARAMETER NAME	VALUE	ERROR	STEP SIZE	FIRST DERIVATIVE
1	Constant	3.88791e+03	1.93015e+01	7.45435e-02	6.53548e-06
2	Mean	1.04344e+04	6.79057e+01	1.03412e-01	-3.38438e-06
3	Sigma	3.38240e+03	6.33874e+01	1.67658e-05	-7.52325e-03



Log scale