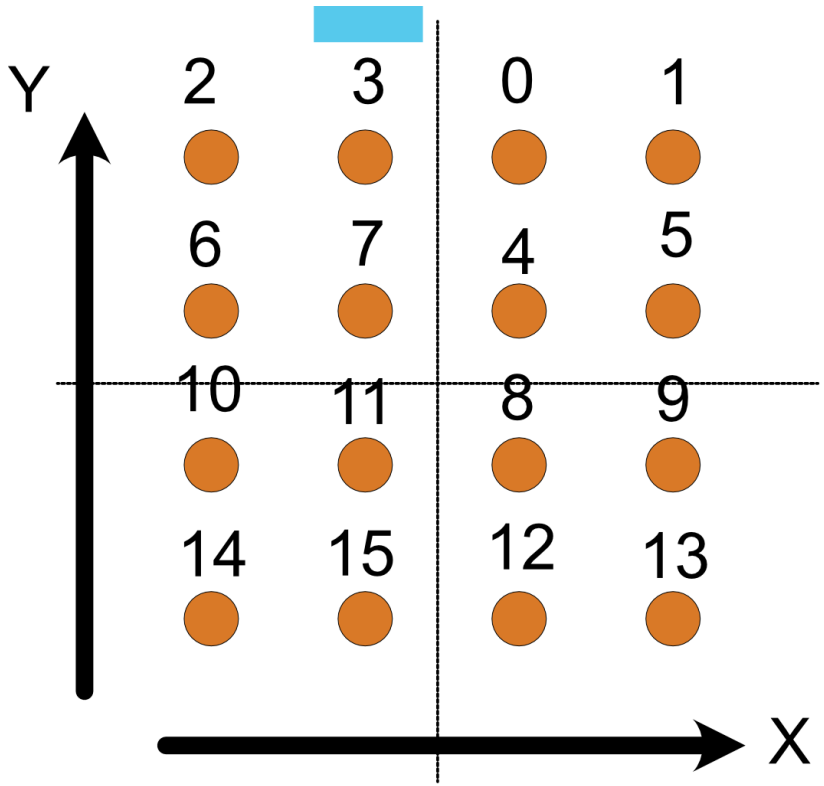
To be followed...

13/09/24

Reminder: Conventions

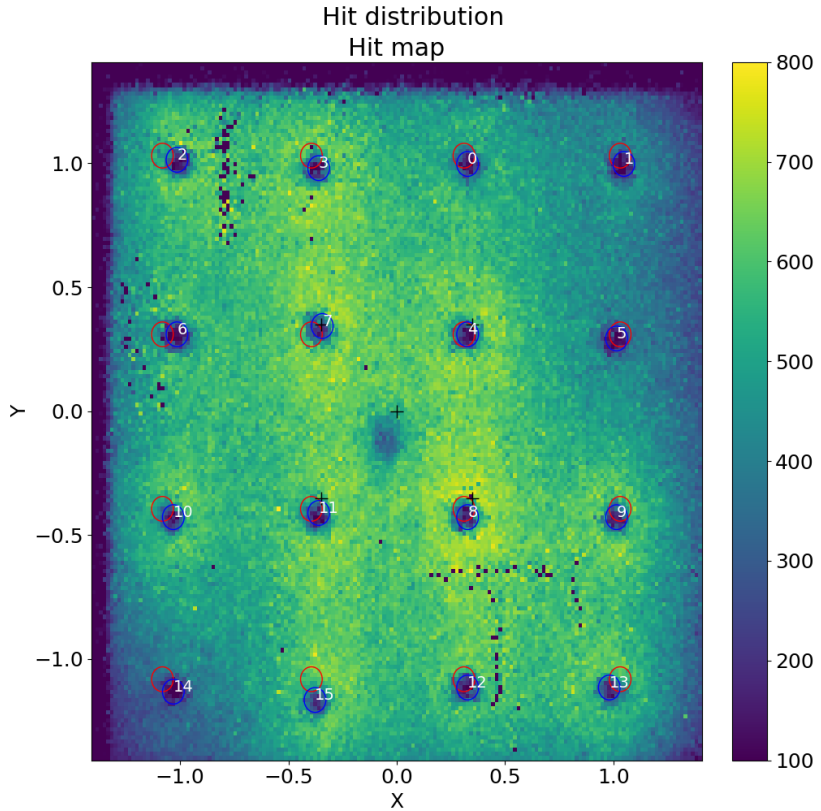


- X-Y convention derived from the drift chambers
- Propagated to the Xm-Ym variables
- Blue square is the drift chamber blind zone

Fibre position

Determining the actual fibre position

- Use the V2 processing (use 2 drift chamber/3)
- Finding the minimum of the mean hit value (blue circle) around an approximate position (red)



Cuts :

eventType	4 (beam event)
hitTot $\sum$hit[i]Cor	$<$ 800 and $>$ 0
diffTrack2	1 (mean distance to track $<$ 250 μm)
muonDZ	>0 (track has been reconstructed)

Results (cm) :

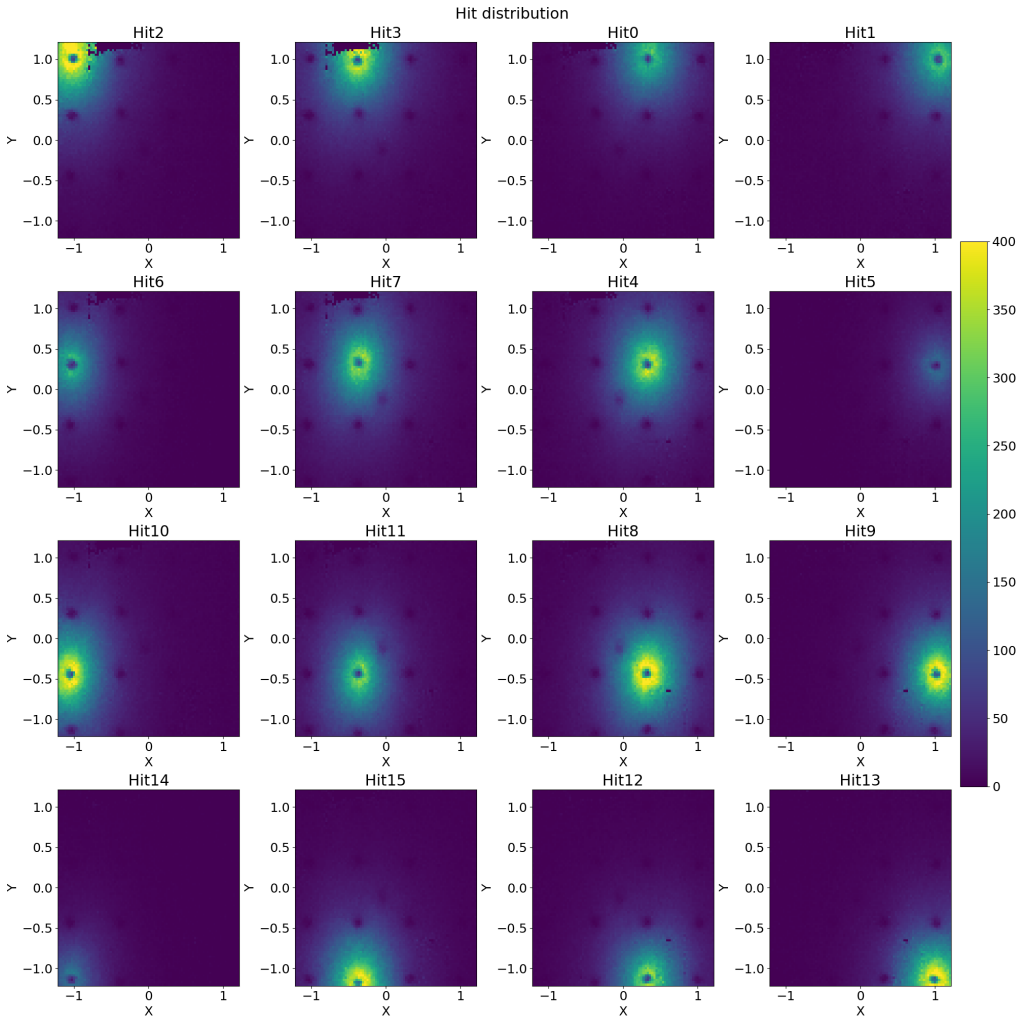
Fiber	0	1	2	3	4	5	6	7
X	0.33	1.05	-1.01	-0.36	0.33	1.01	-1.01	-0.34
Y	1.0	1.0	1.01	0.98	0.31	0.29	0.31	0.34

Fiber	8	9	10	11	12	13	14	15
X	0.33	1.01	-1.03	-0.36	0.33	0.98	-1.03	-0.38
Y	-0.43	-0.43	-0.43	-0.41	-1.11	-1.11	-1.13	-1.17

I. Homogenisation of the fibres responses

Introduction

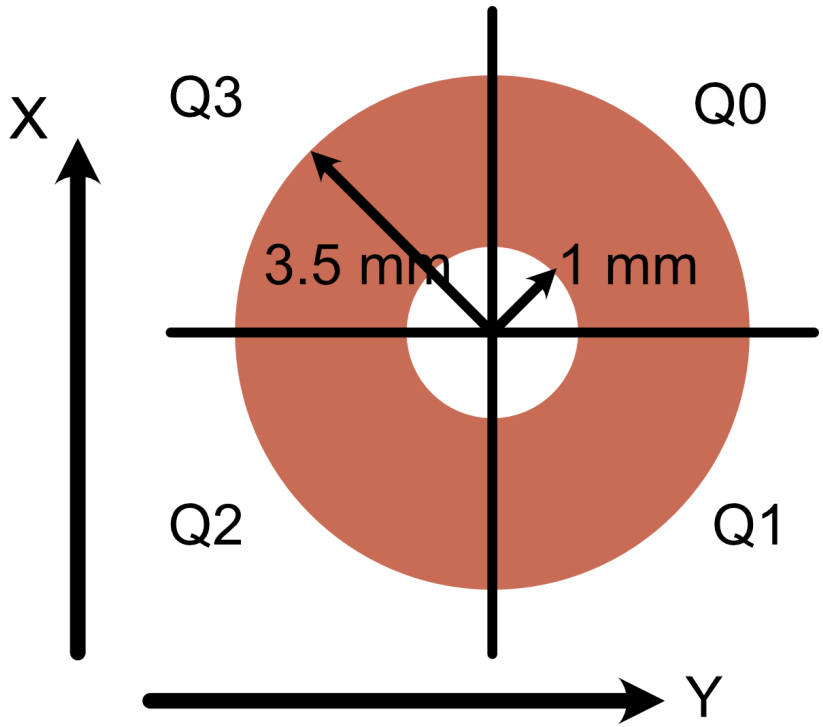
- Use muons data (V3 processing)



Hit Map for each fibre

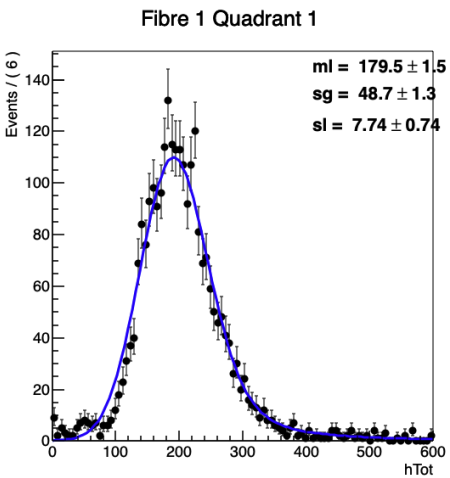
Quarters definition

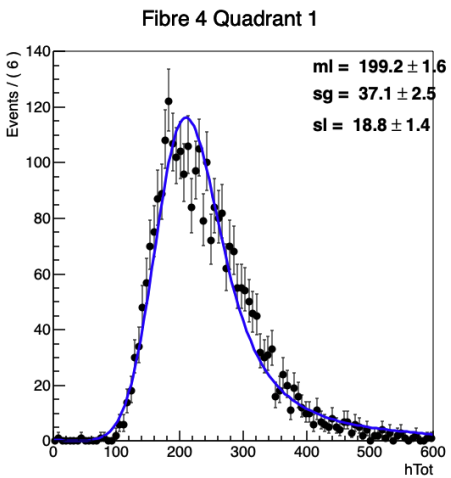
- Compute the MPV value of the PE/track around each fibre
- Use quarters in order to avoid borders effects (1 quarter used in the corner, 4 in the boundaries and center)
- Homogenise to the MPV

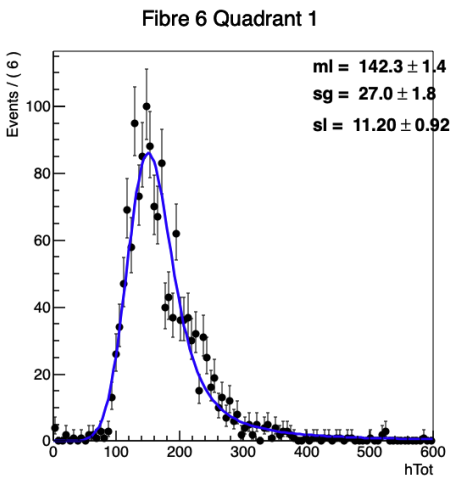


Examples

Fits examples :





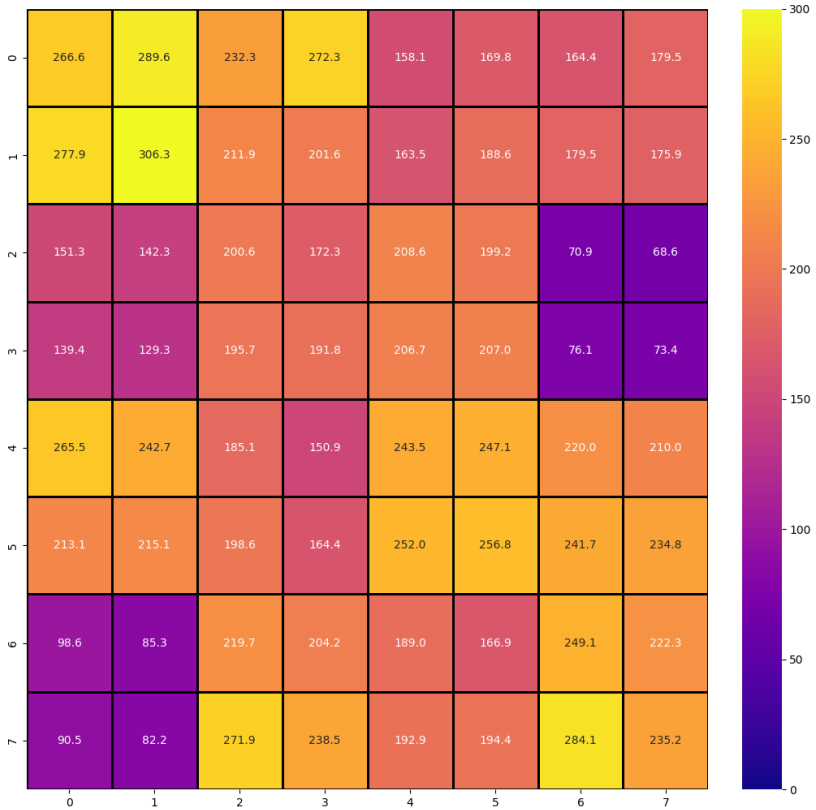


Results

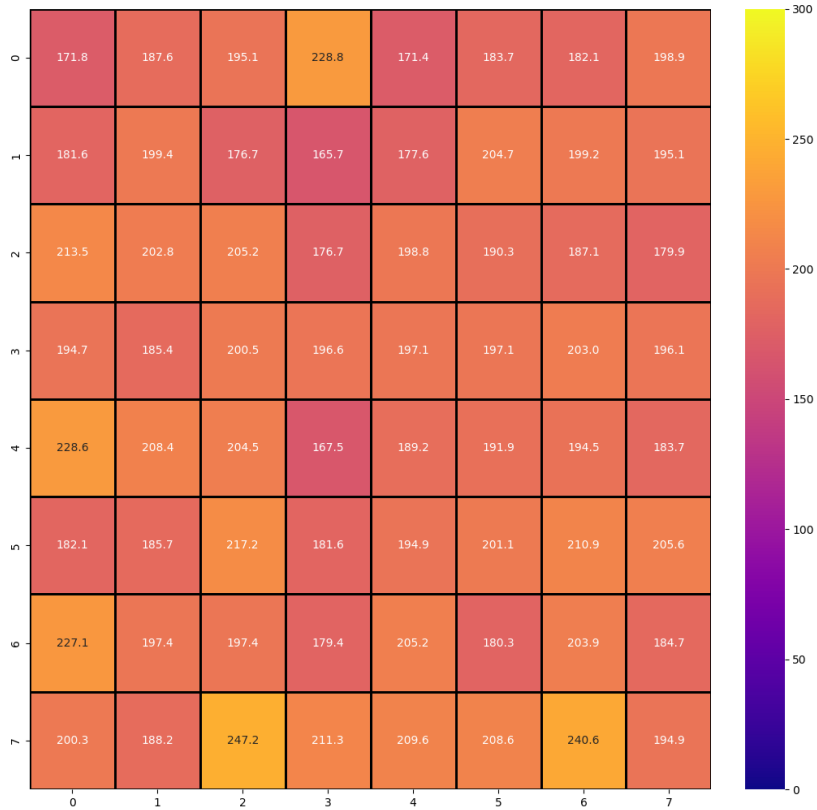
Coefficients :

$$hit[i]_{\text{corrected}} = \frac{hit[i]}{coeff[i]}$$

Map of each quadrants (4/fibres) of hit[i]Cor (not htot!):



Before applying the coefficients



After applying the coefficients

Can be enabled/disabled in the processing.

II. Borders effects

Cuts

Run 60 (Muons)

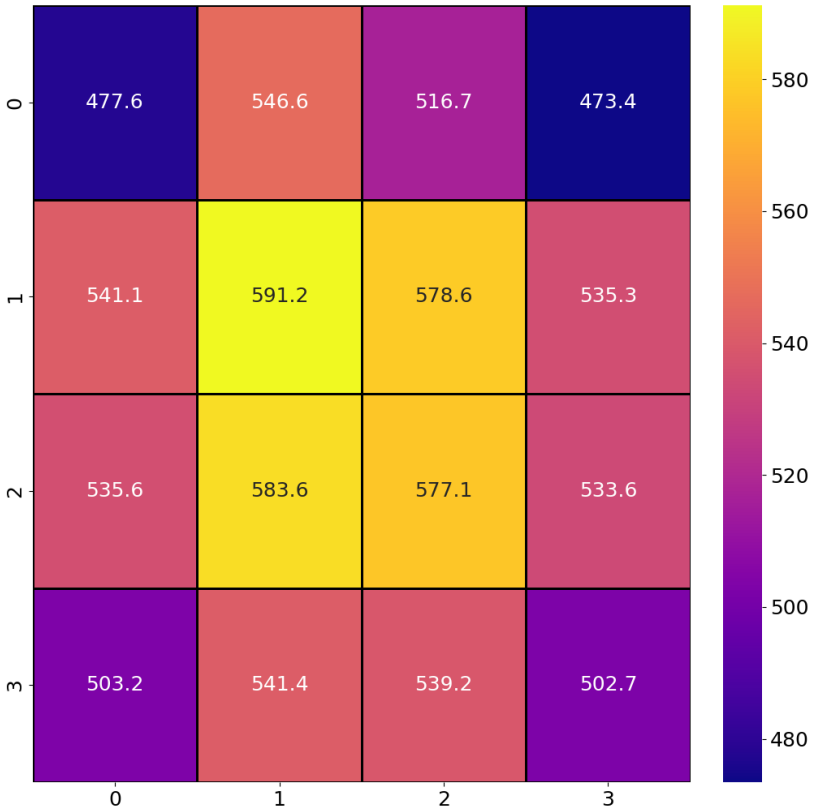
Cuts (for fibre i):

eventType	4 (beam event)
hitTot $\sum$hit[i]Cor	< 2000 and > 0
diffTrack2	1 (mean distance to track < 250 μm)
muonDZ	>0 (track has been reconstructed)

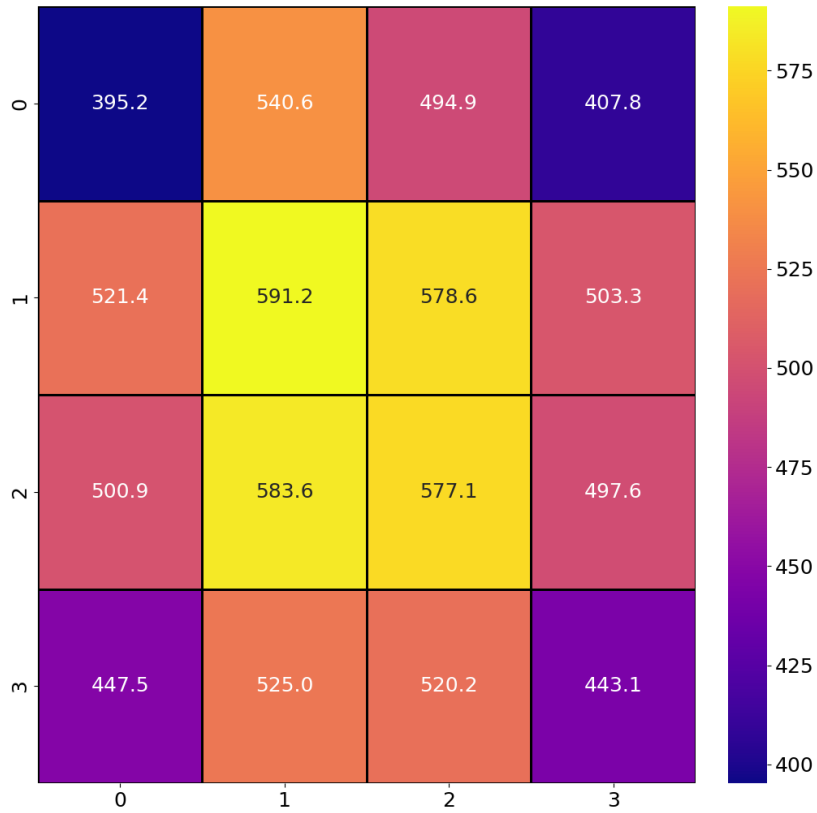
For quadrants definition:

dist2 = $\sqrt{(xM - x[i])^2 + (yM - y[i])^2}$	(round) dist2> 1 mm and dist2<3.5 mm
dist3a = $abs(xM - x[i])$	(square) dist2> 1 mm and dist3a and dist3b <3.5 mm
dist3b = $abs(yM - y[i])$	xM and yM
> -1.3 and < 1.3	

Results 1/2



Round, 1,2,4 quadrant depending of the position



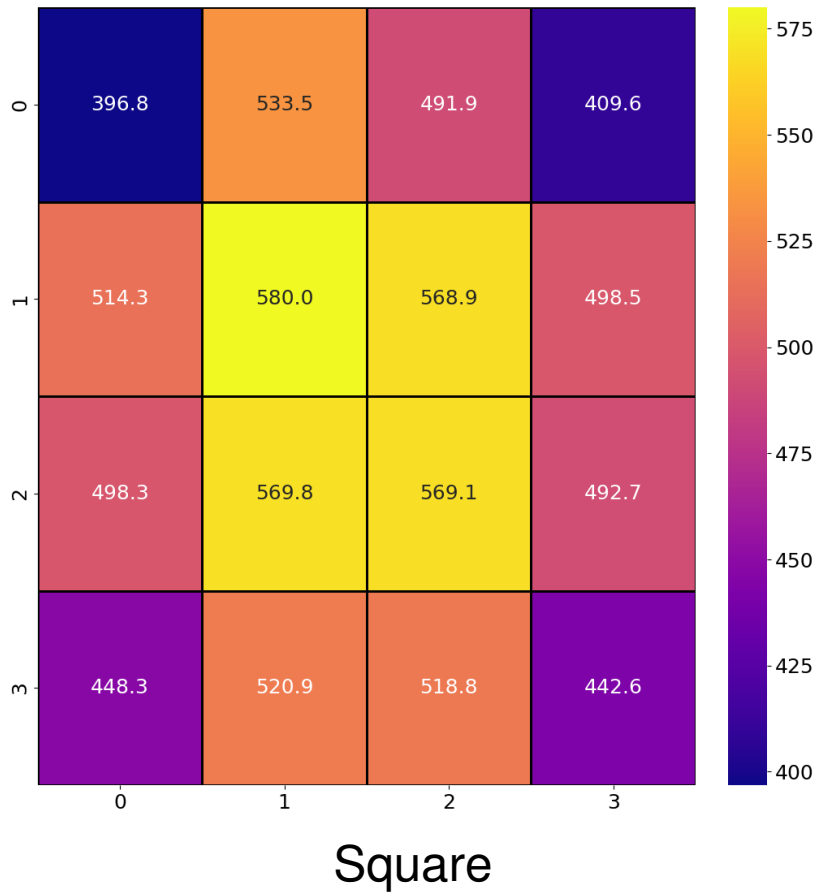
Round full

- Maybe a border effect can be observed
- Roofit did not converge without applying the coefficient, sorry.

Results 2/2

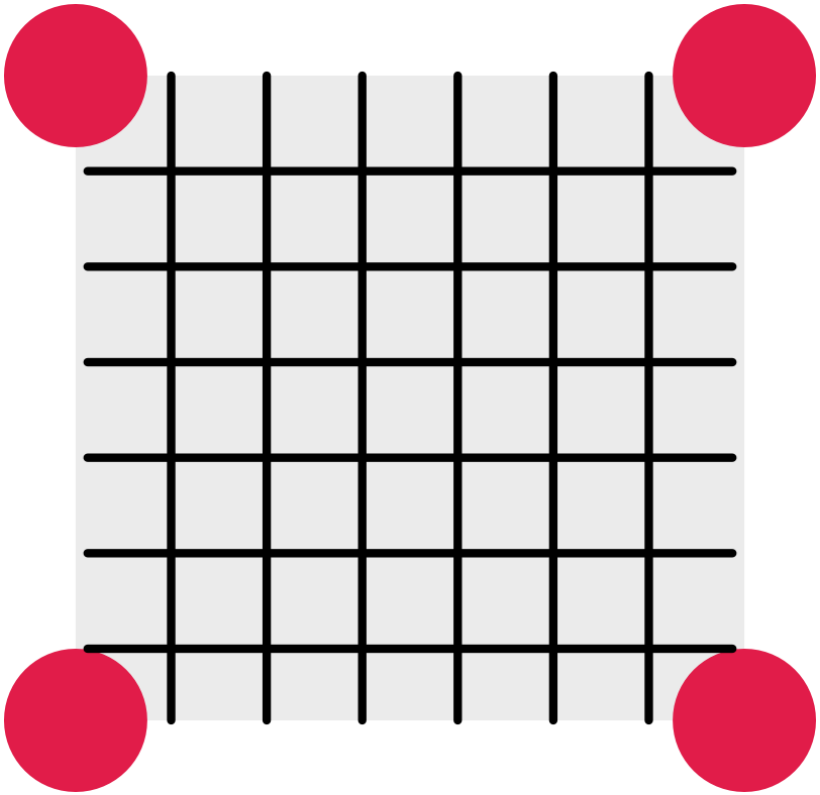
Average values :

- Center: 571.9 ± 5.6 PE
- Corner: 424.3 ± 25.7 PE
- borders: 508.6 ± 20.8 PE



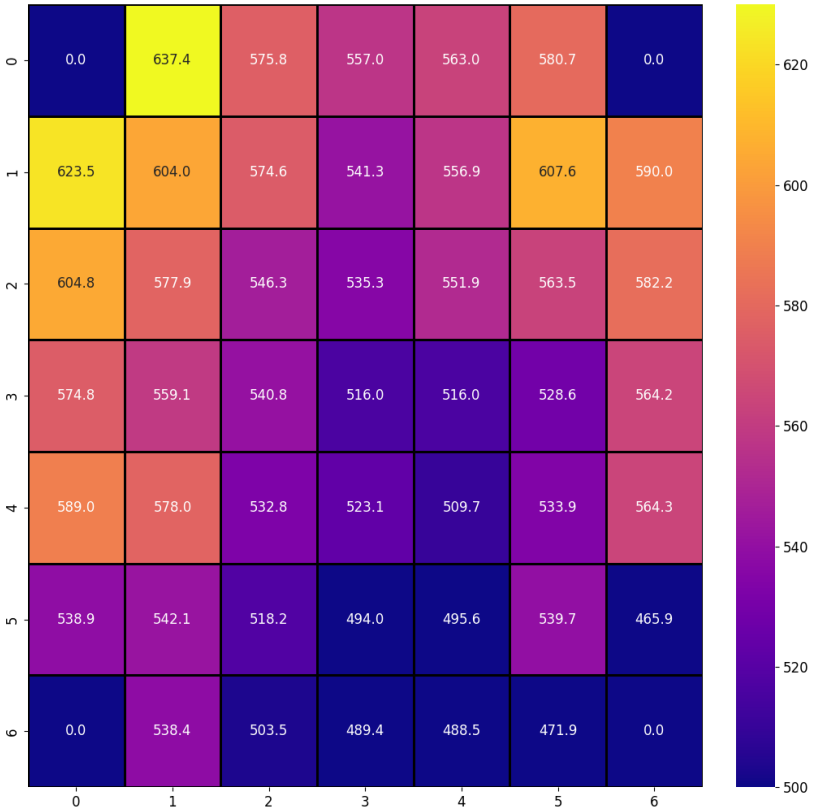
III. Uniformity map

Reminder: Conventions

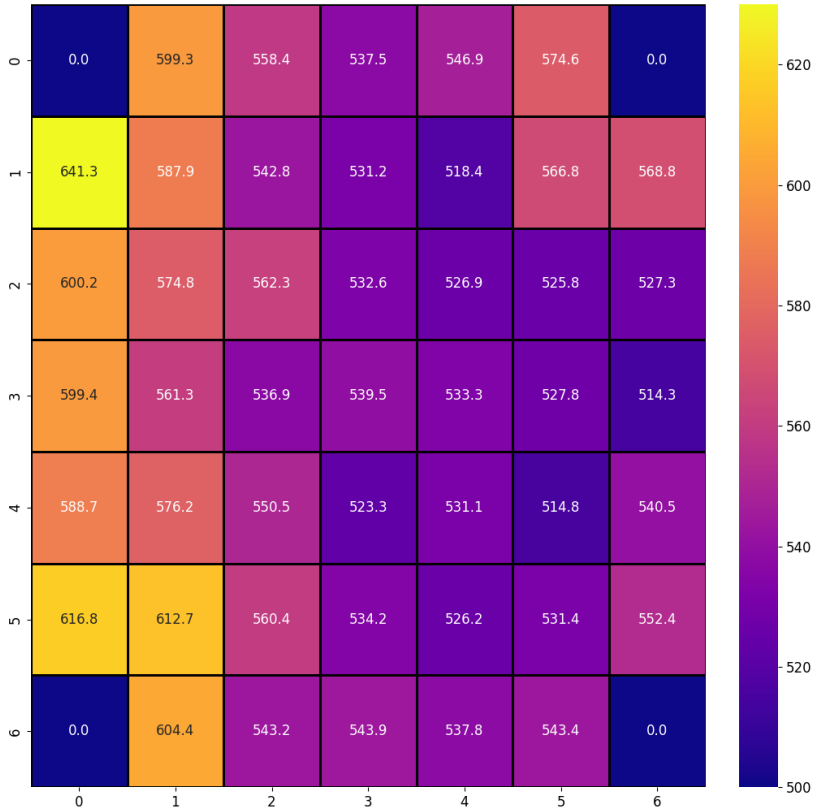


- Space in a 4-fibre square cut in 49x1 mm^2 squares
- Landau x Gaussian fit in each
- 9 squares can be built
- MPV map can be produced for each square
- Warning : Plots produced 5 minutes ago !

Results 1/3

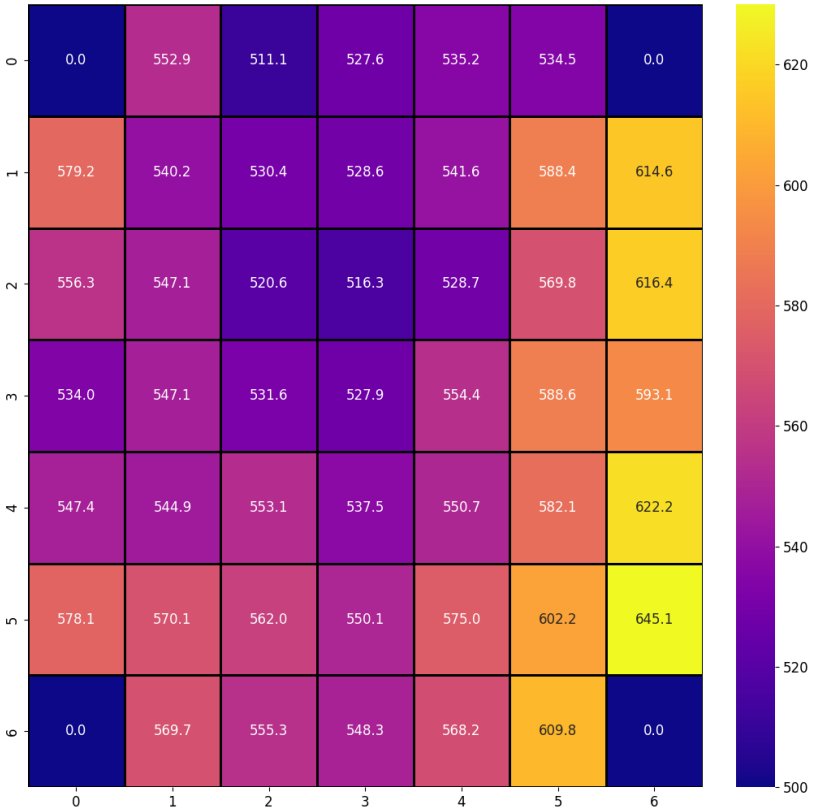


Square 7-3-0-4 (border)

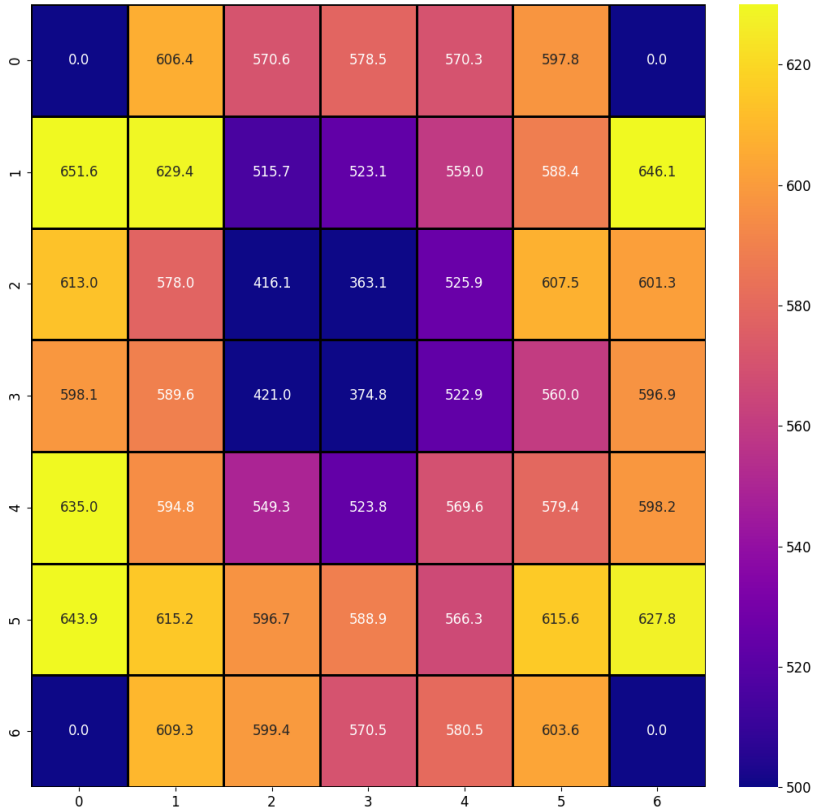


Square 8-4-5-9 (border)

Results 2/3

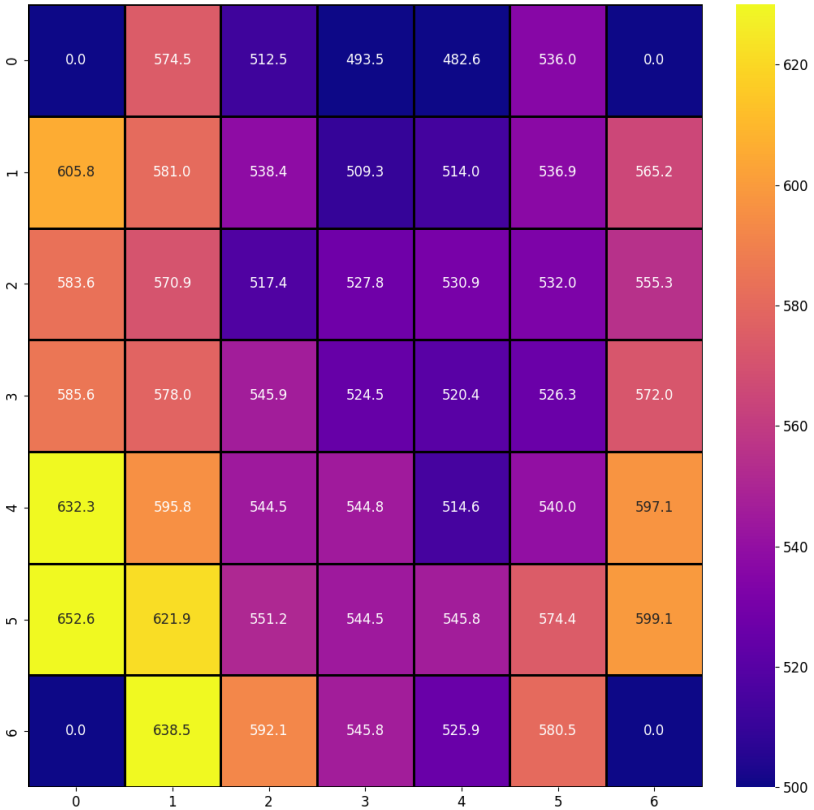


Square 10-11-7-6 (border)



(center)

Results 2/3



Square 15-12-11-8 (border)