

**$^{55}\text{Fe}$  in LIME**

# Experimental data set

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16 June 2020 - Test of LIME. Z scan with  $^{55}\text{Fe}$  -  $V_{\text{gem}} = 450$ , Drift Field 800V/cm

	3640	200	30	Bar pos = 6cm (5 cm far from GEM)	60/40	500	450	450	450
	3641	200	30	Bar pos = 11cm (10 cm far from GEM)	60/40	500	450	450	450
	3642	200	30	Bar pos = 16cm (15 cm far from GEM)	60/40	500	450	450	450
	3643	200	30	Bar pos = 21cm (20 cm far from GEM)	60/40	500	450	450	450
	3644	200	30	Bar pos = 26cm (25 cm far from GEM)	60/40	500	450	450	450
	3645	200	30	Bar pos = 31cm (30 cm far from GEM)	60/40	500	450	450	450
	3646	200	30	Bar pos = 36cm (35 cm far from GEM)	60/40	500	450	450	450
	3647	200	30	Bar pos = 41cm (40 cm far from GEM)	60/40	500	450	450	450
	3648	200	30	Bar pos = 46cm (45 cm far from GEM)	60/40	500	450	450	450

Analysed runs were taken with LIME with this setup:

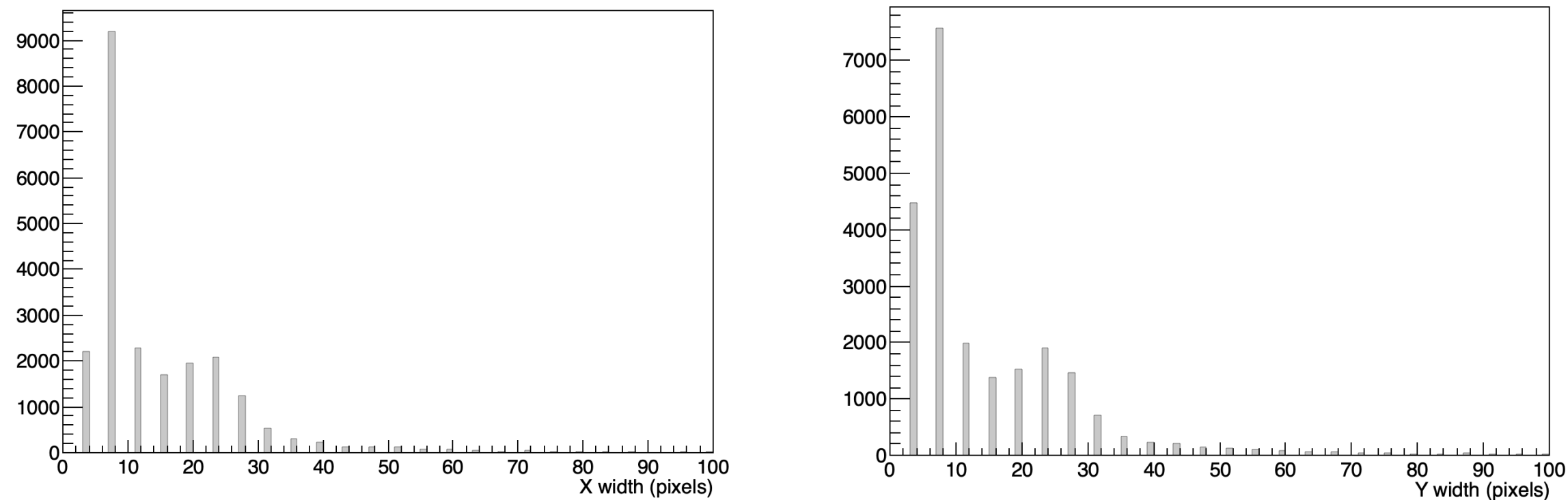
- $V_{\text{GEM}} = 450\text{V}$ ;
- Drift field 800 V/cm
- Different z positions of  $^{55}\text{Fe}$  source

# Analysis method

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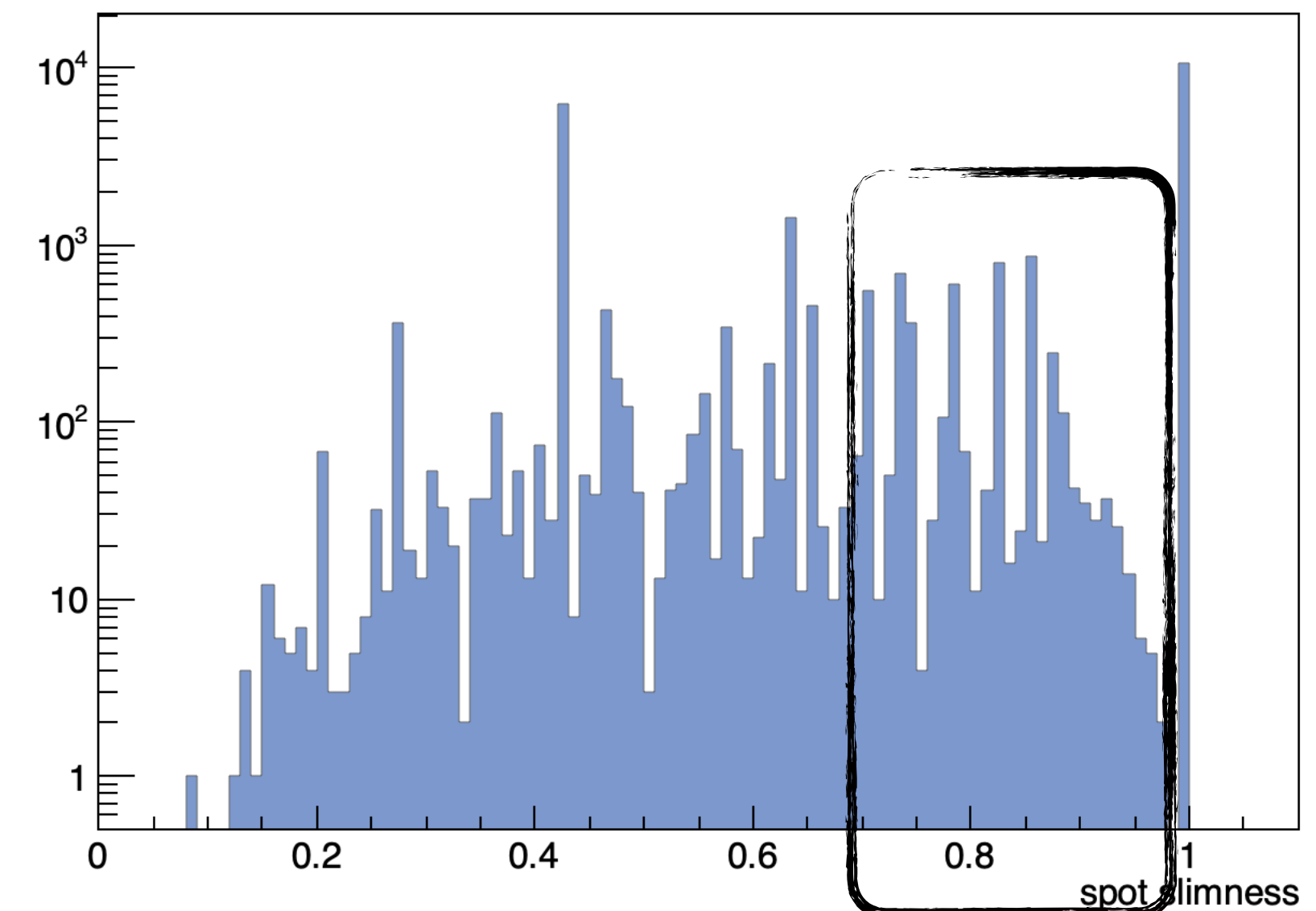
I used a very simple script, with NNC clustering (not DBSCAN);

Once the clusters were found, there was a minimal selection



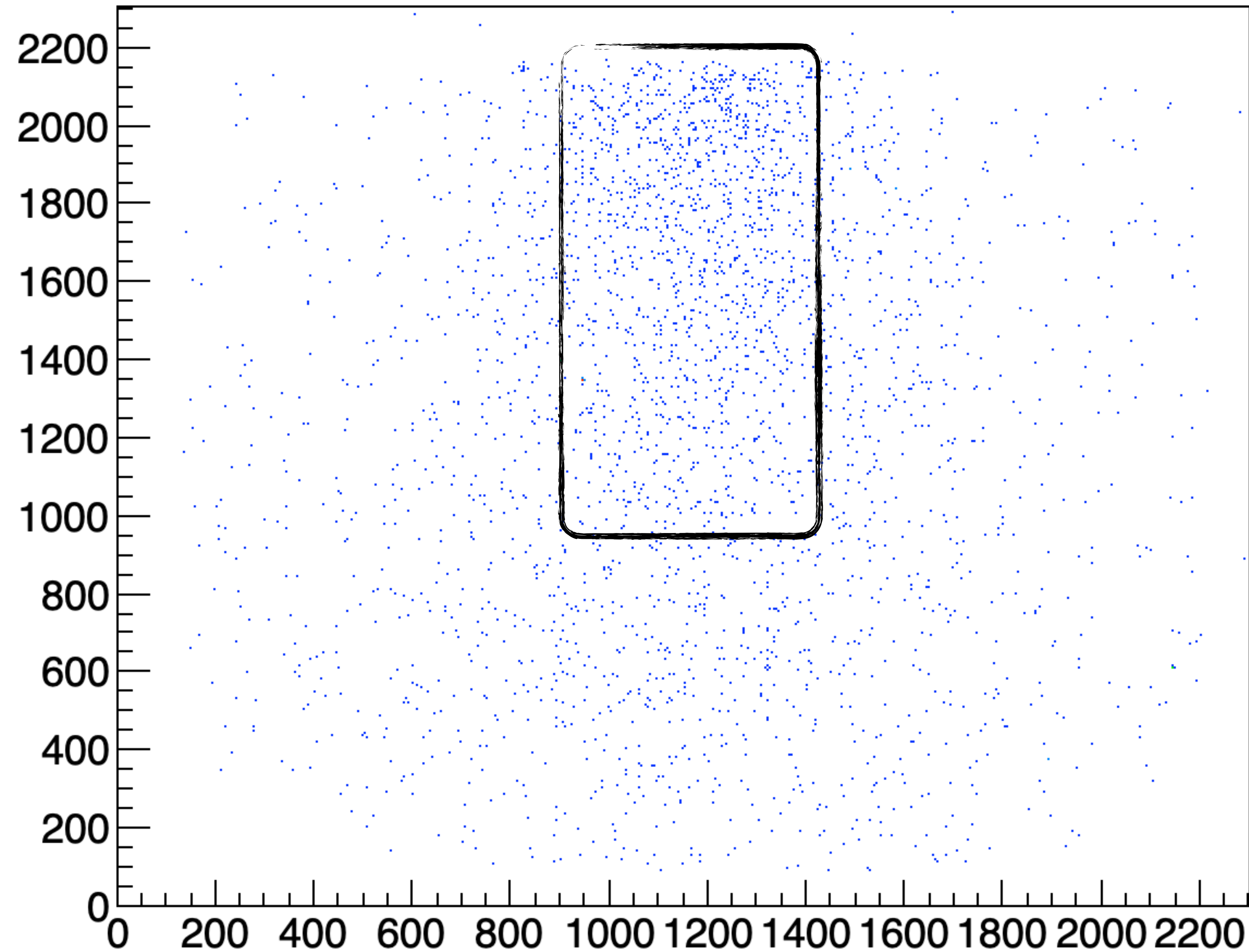
X and Y width (on the rebinned image)  
larger than *2 rebins*;

slimness between 0.7 and 1.0



# Experimental spot distribution

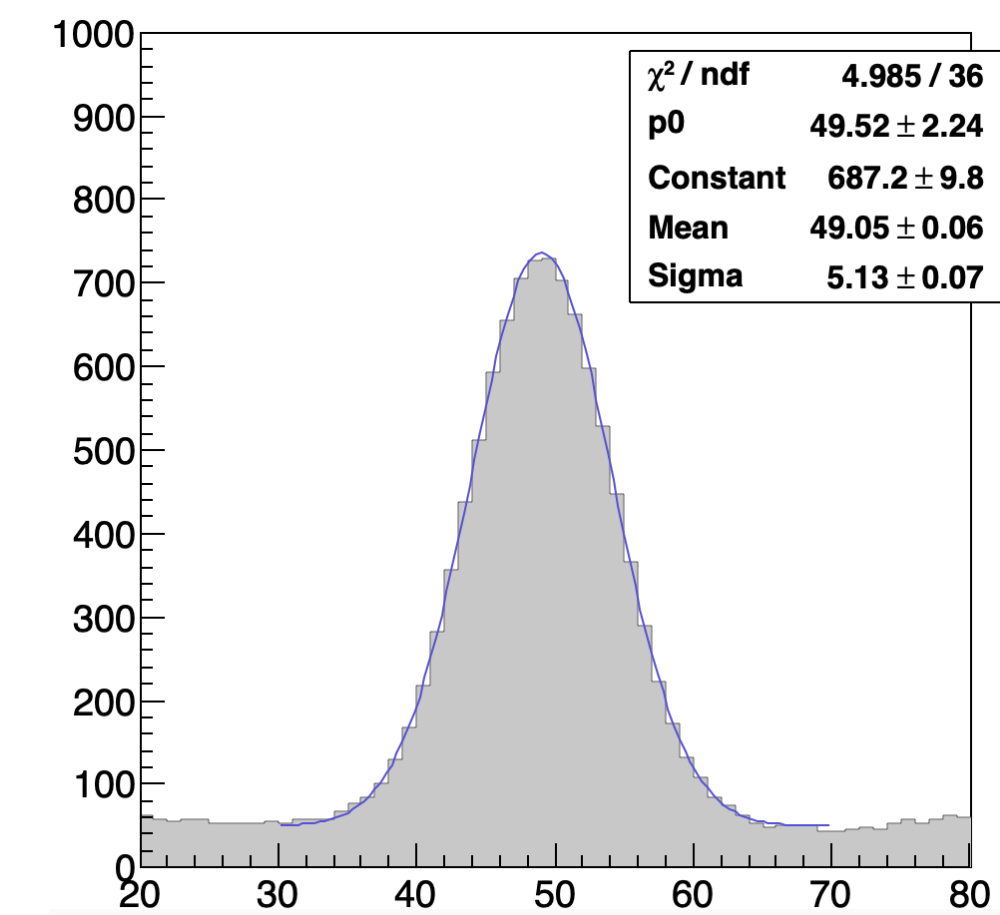
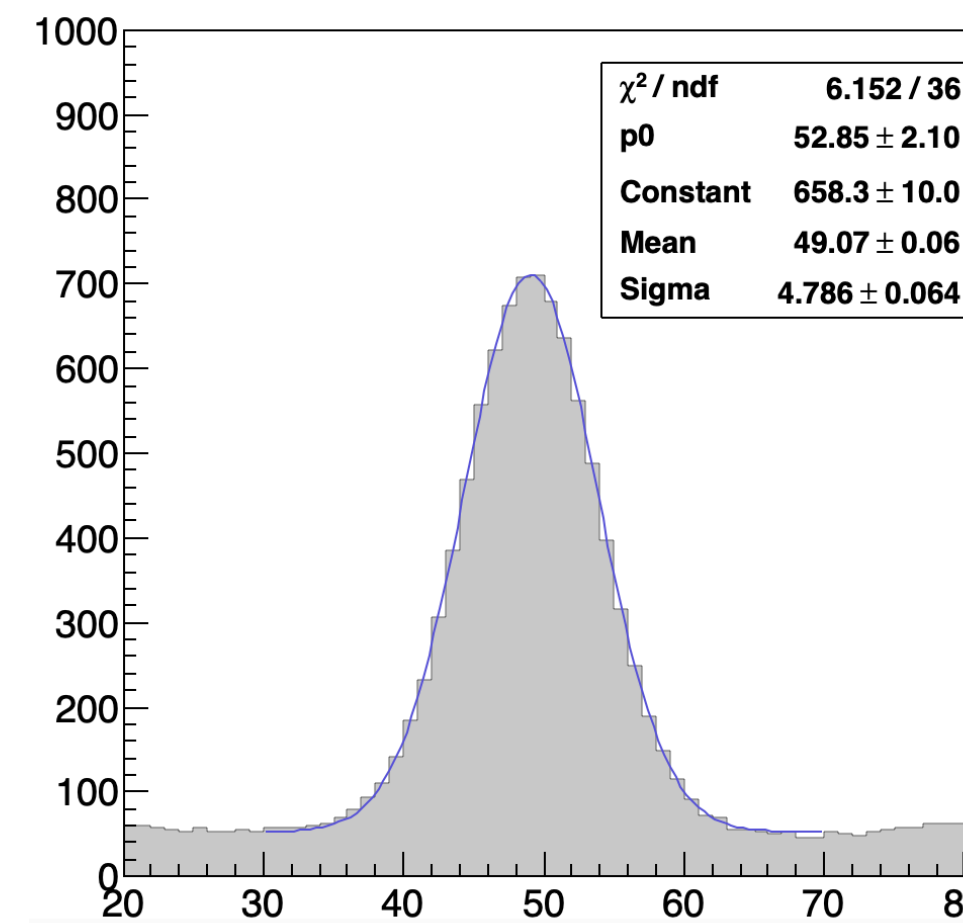
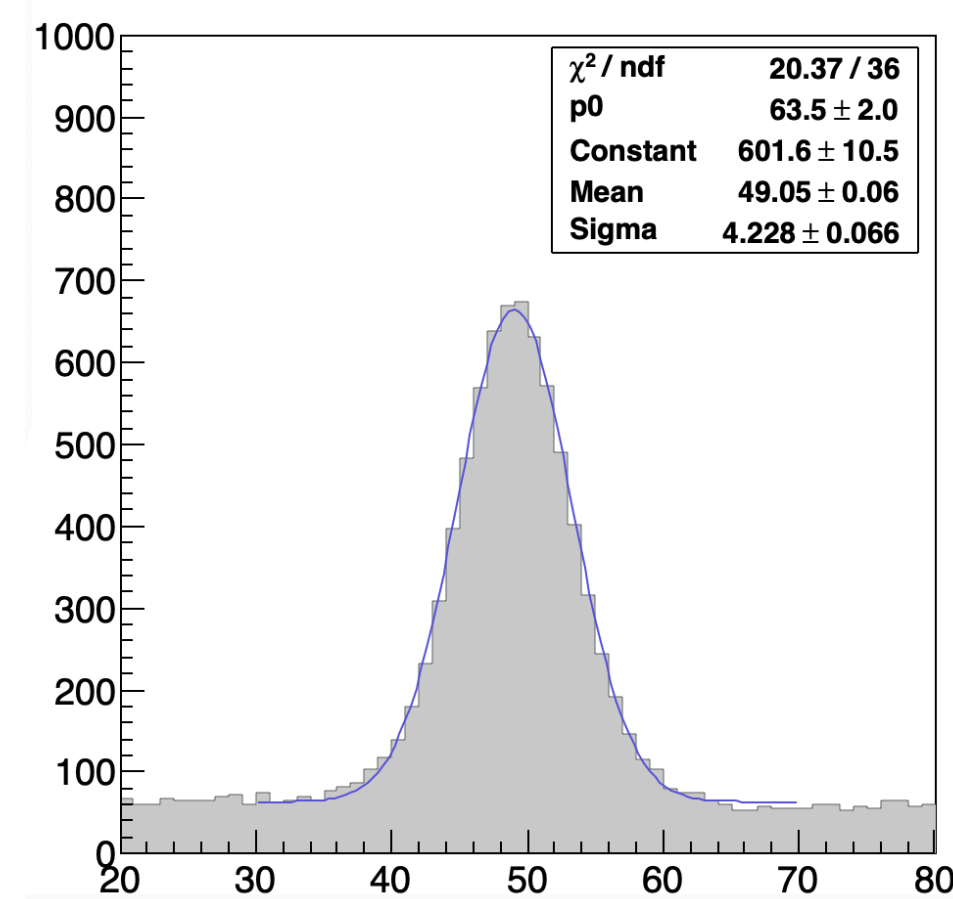
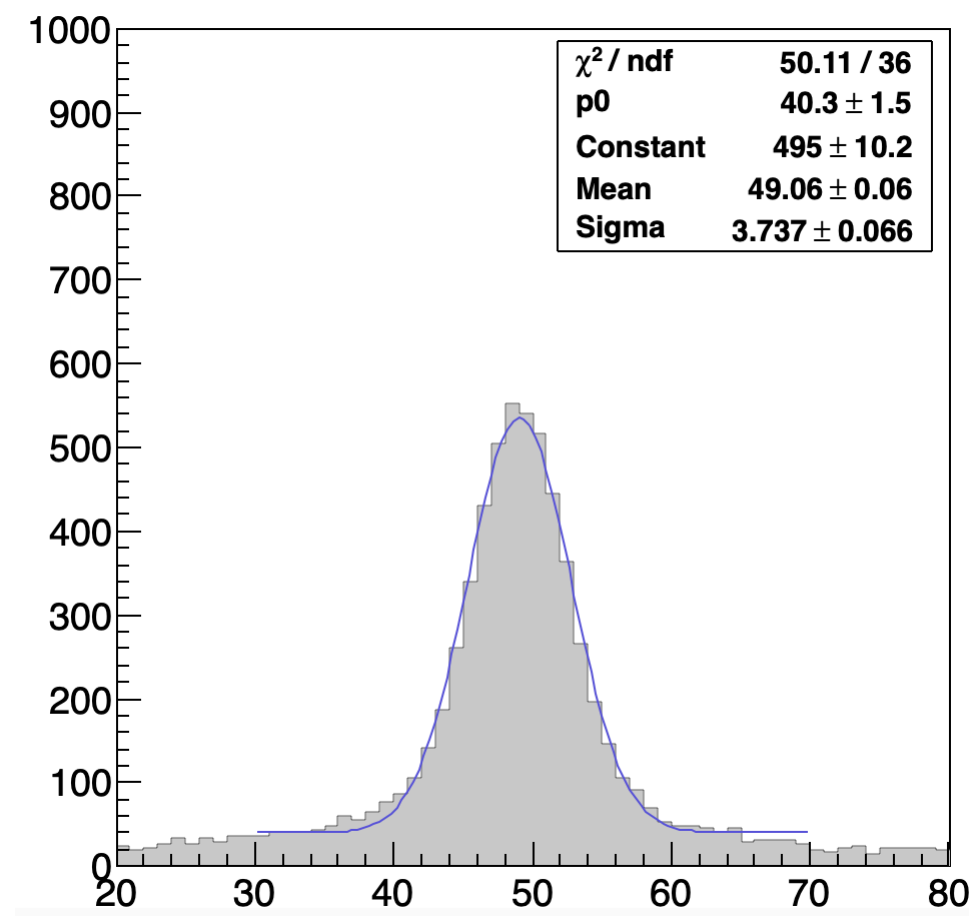
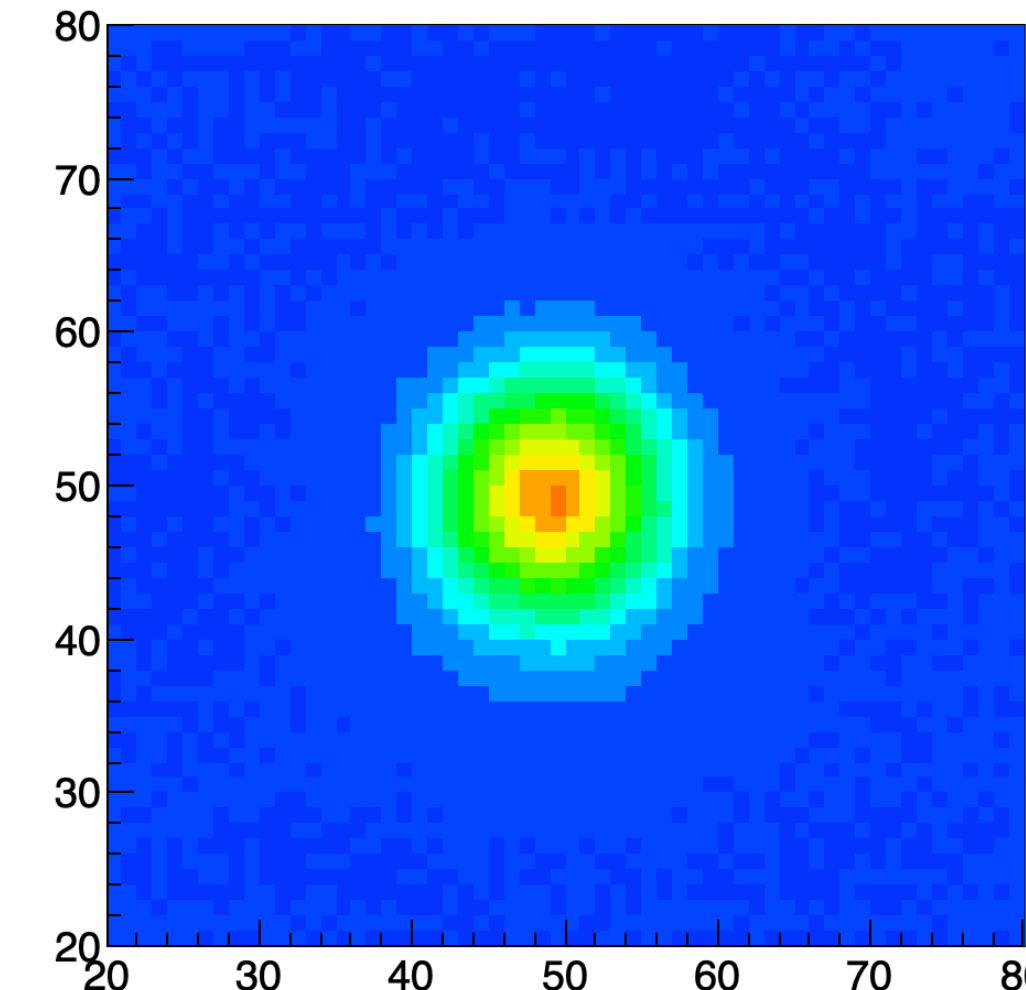
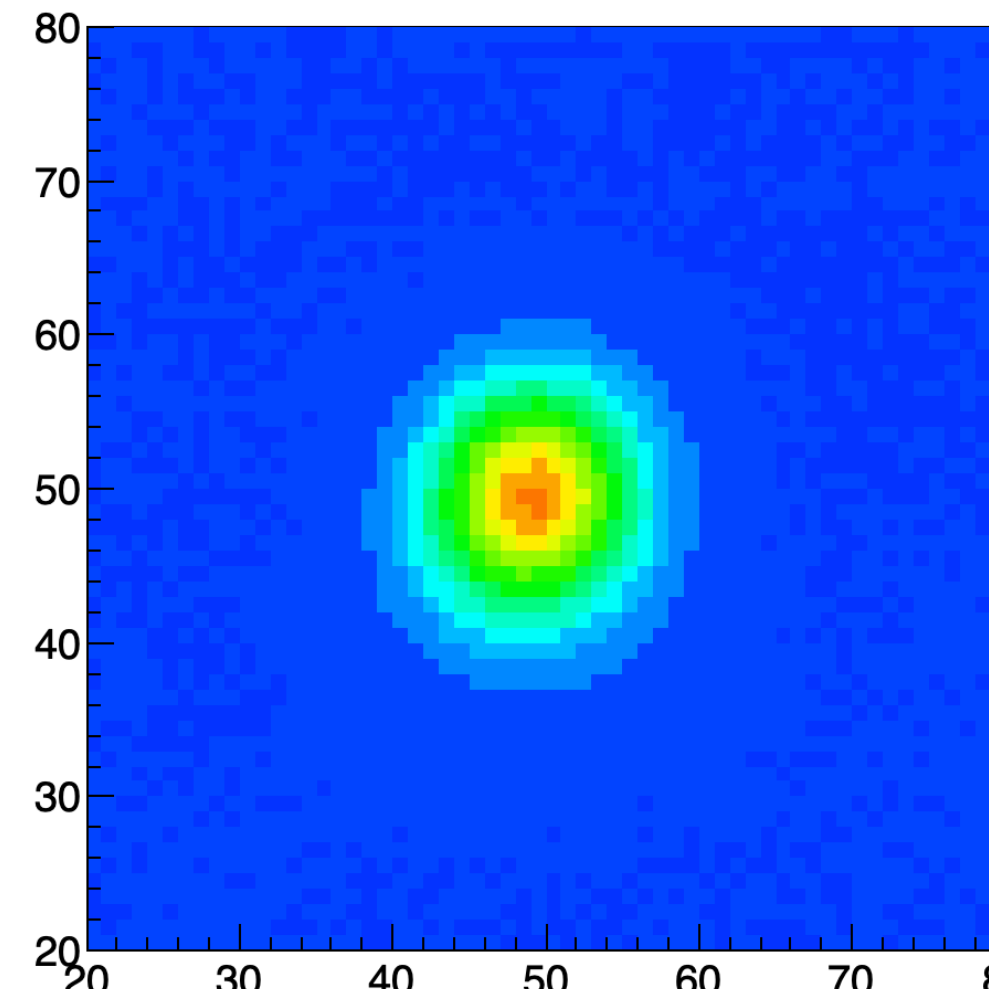
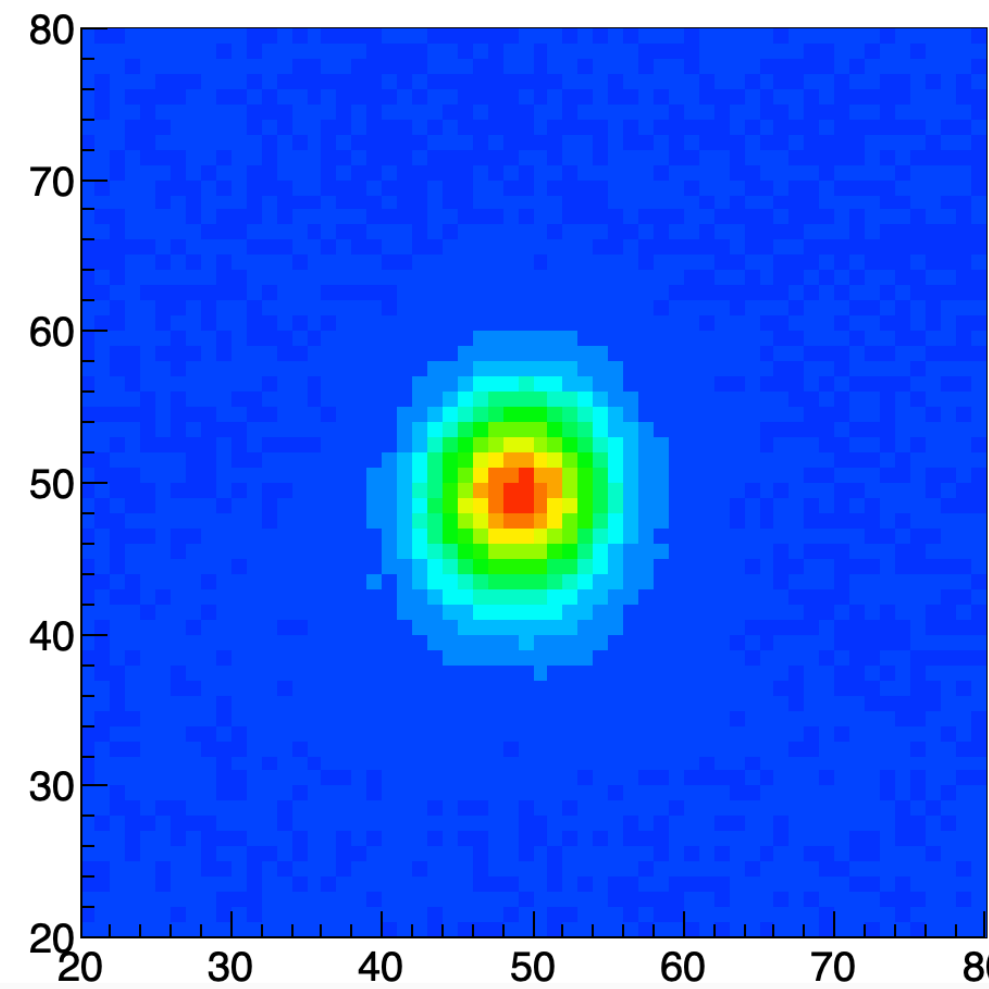
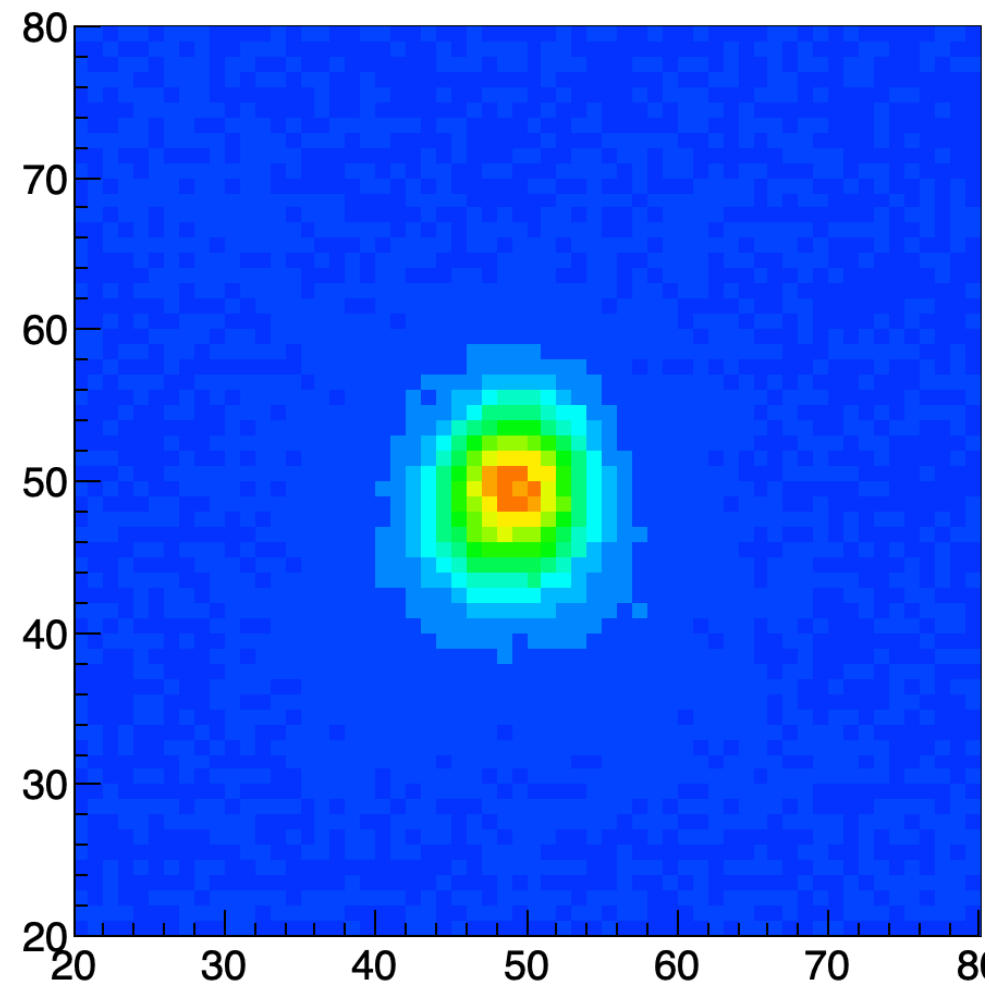
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Only the most illuminated region was taken into account

All spots found were superimposed in order to evaluate the average shape in each run

# Experimental spot shapes



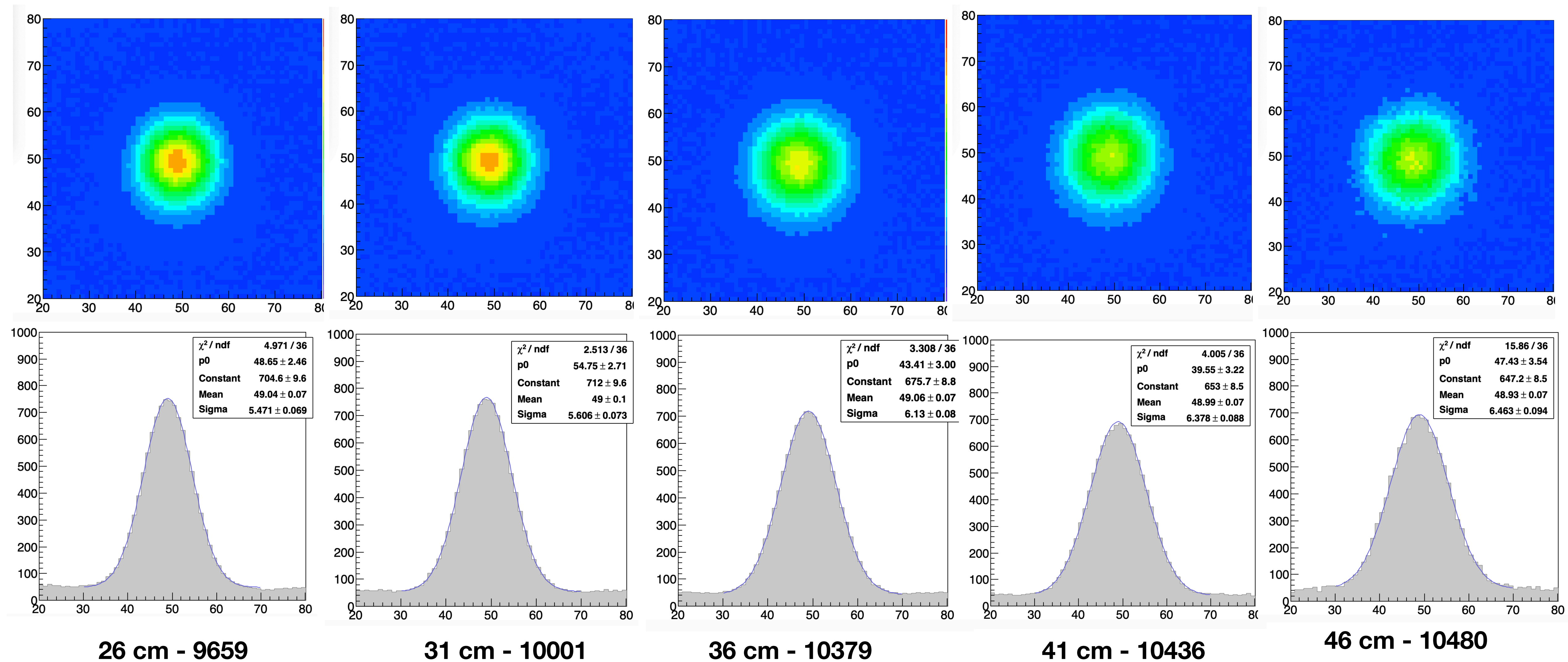
**6 cm - light = 4635**

**11 cm - light = 6373**

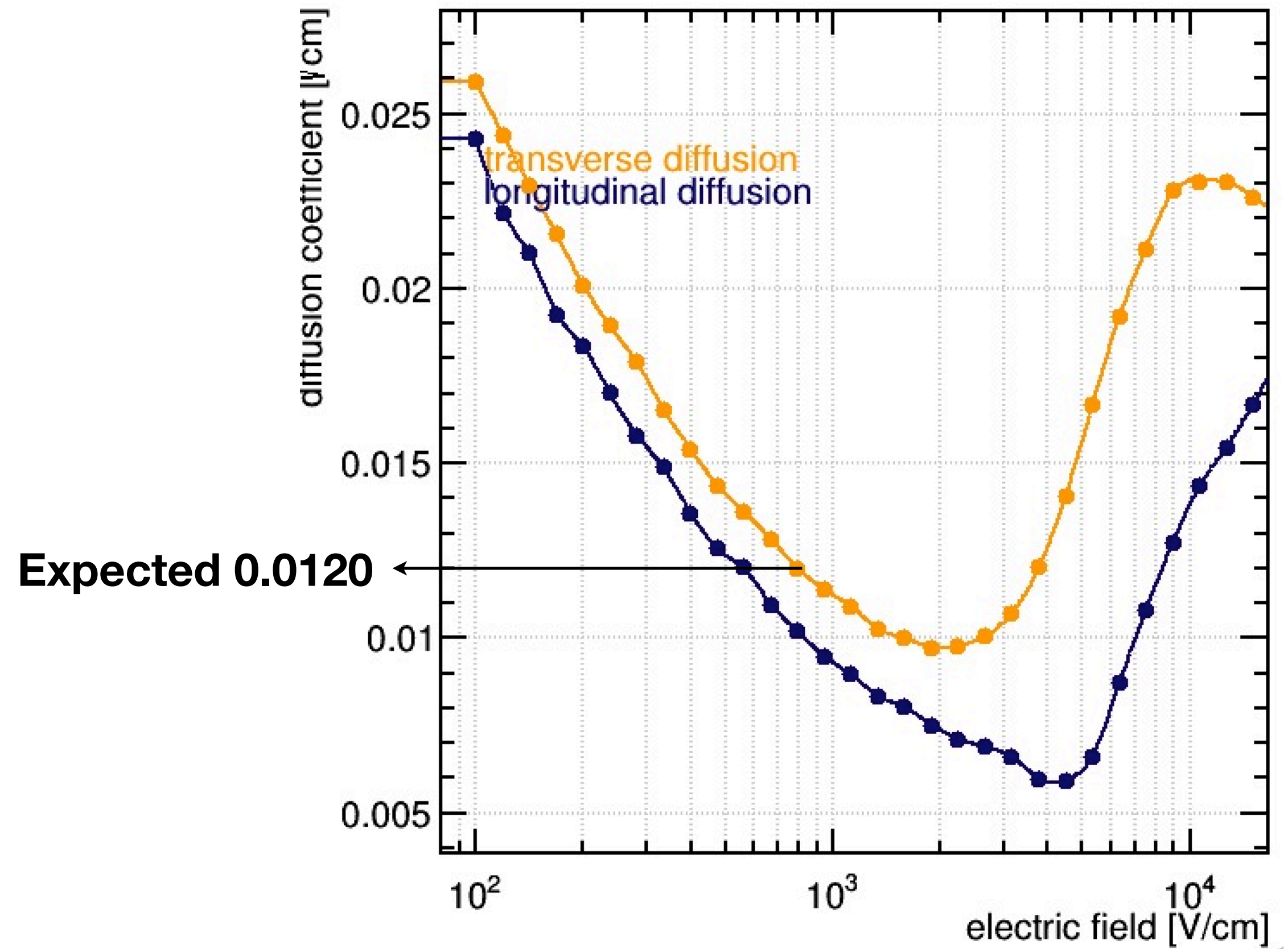
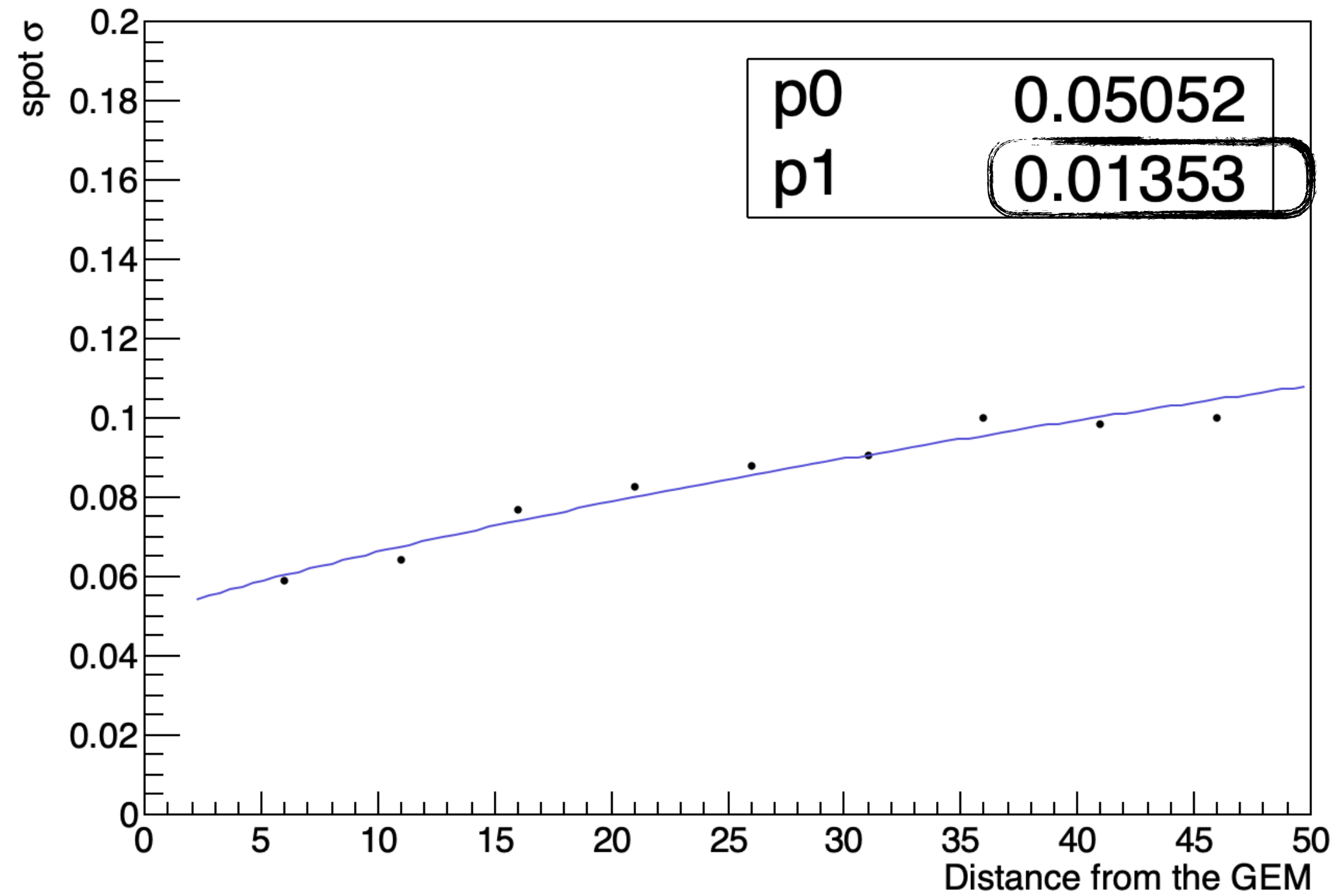
**16 cm - light = 7895**

**21 cm - light = 8834**

# Experimental spot shapes

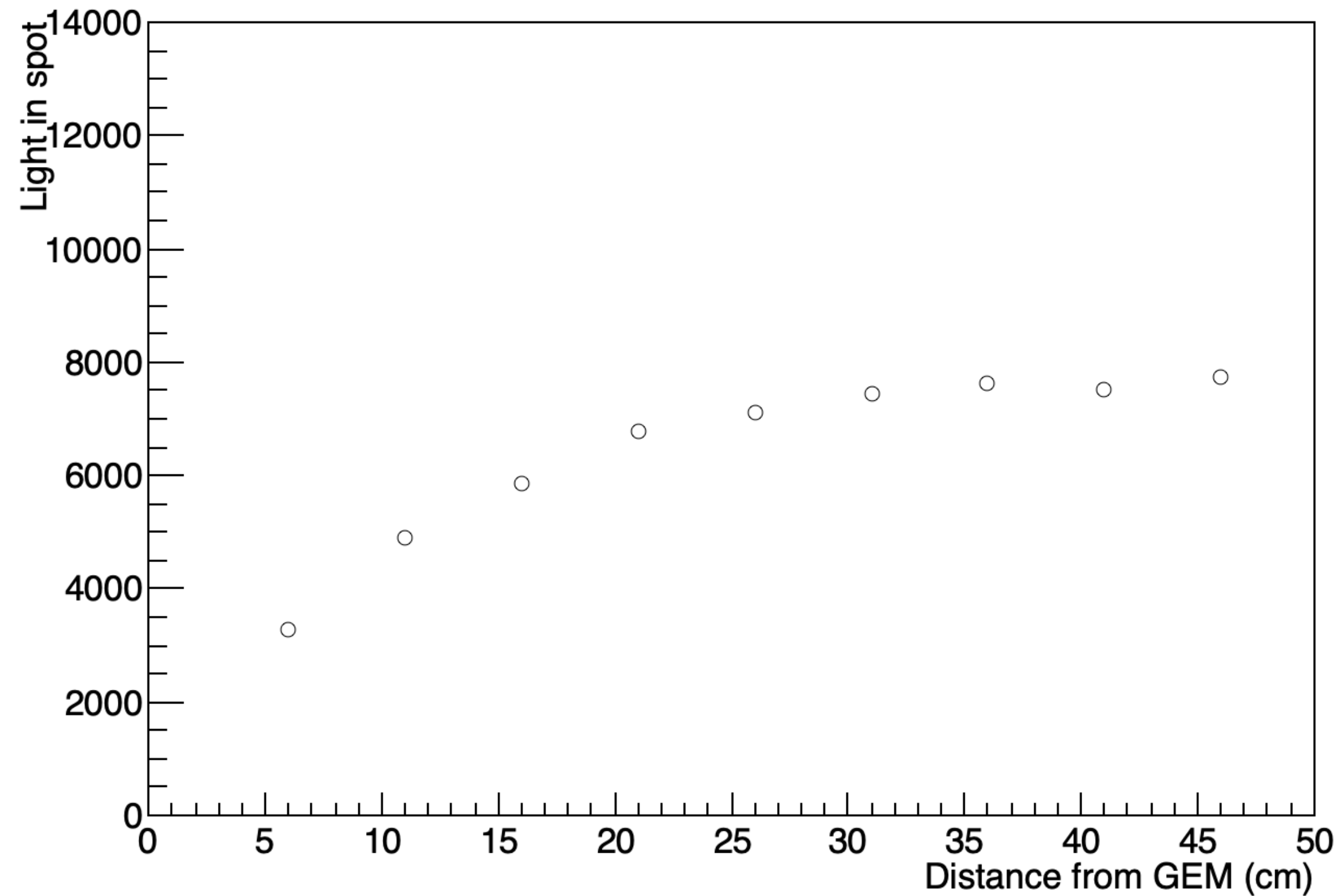


# Experimental spot shapes



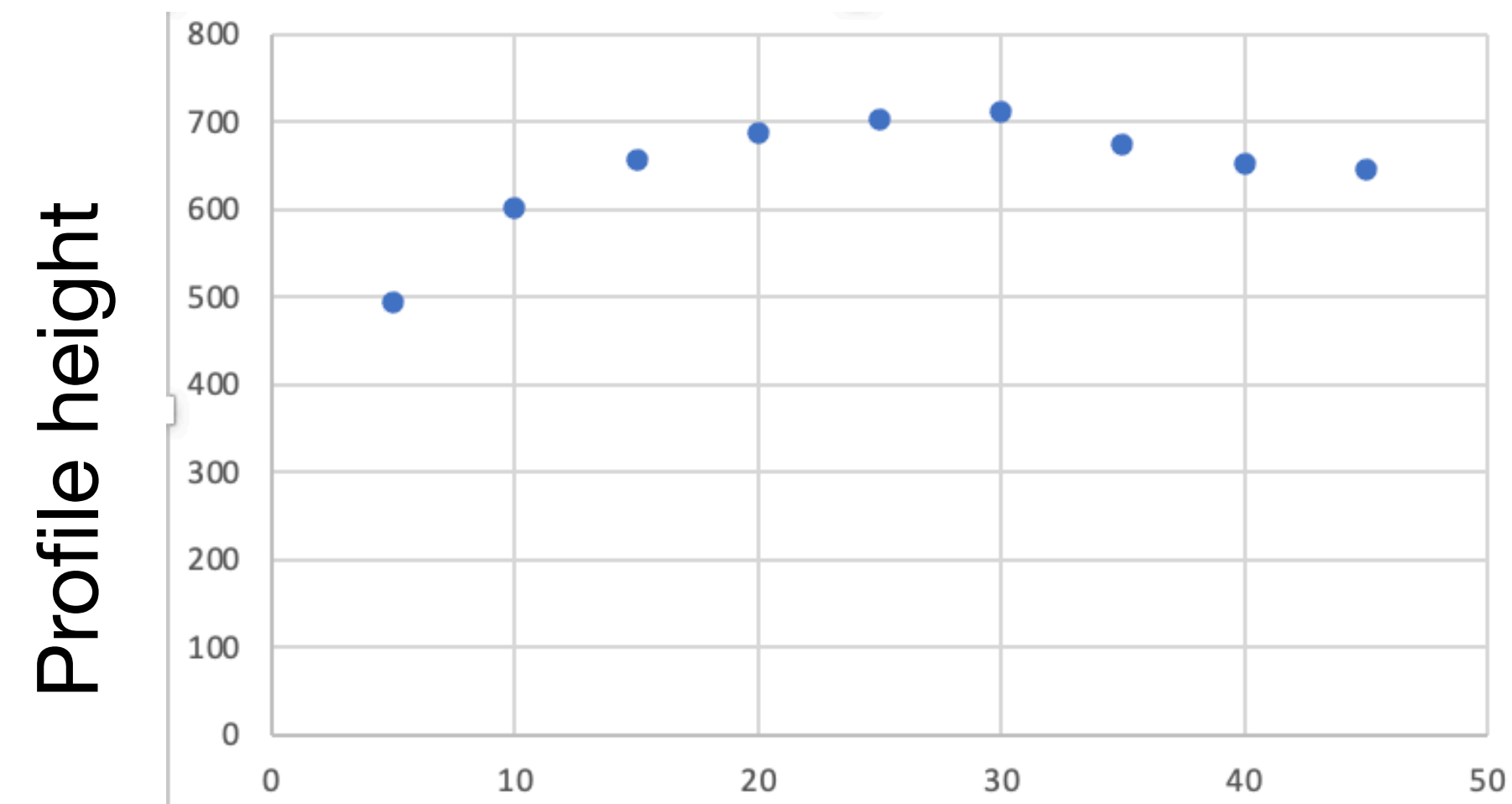
# Experimental spot shapes

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We clearly see an increase due to non linearity;

Not leakage at high distances;



Very similar behavior of height. Probably longitudinal diffusion is playing a role



# Experimental spot shapes

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