

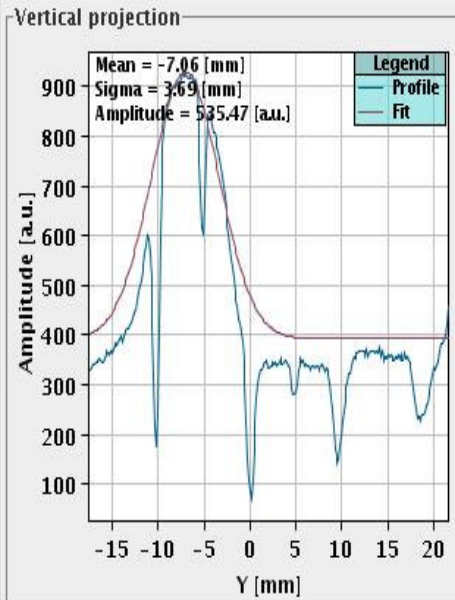
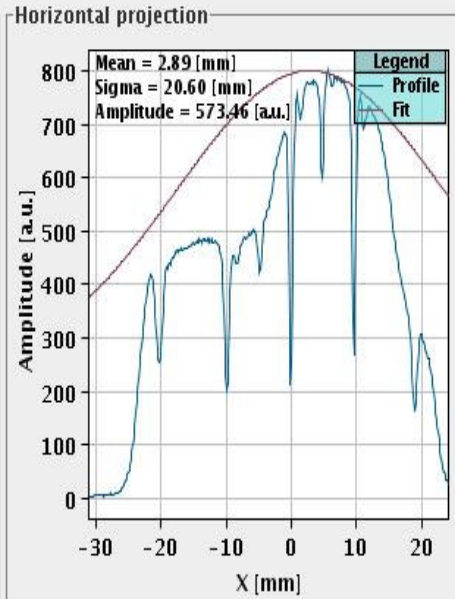
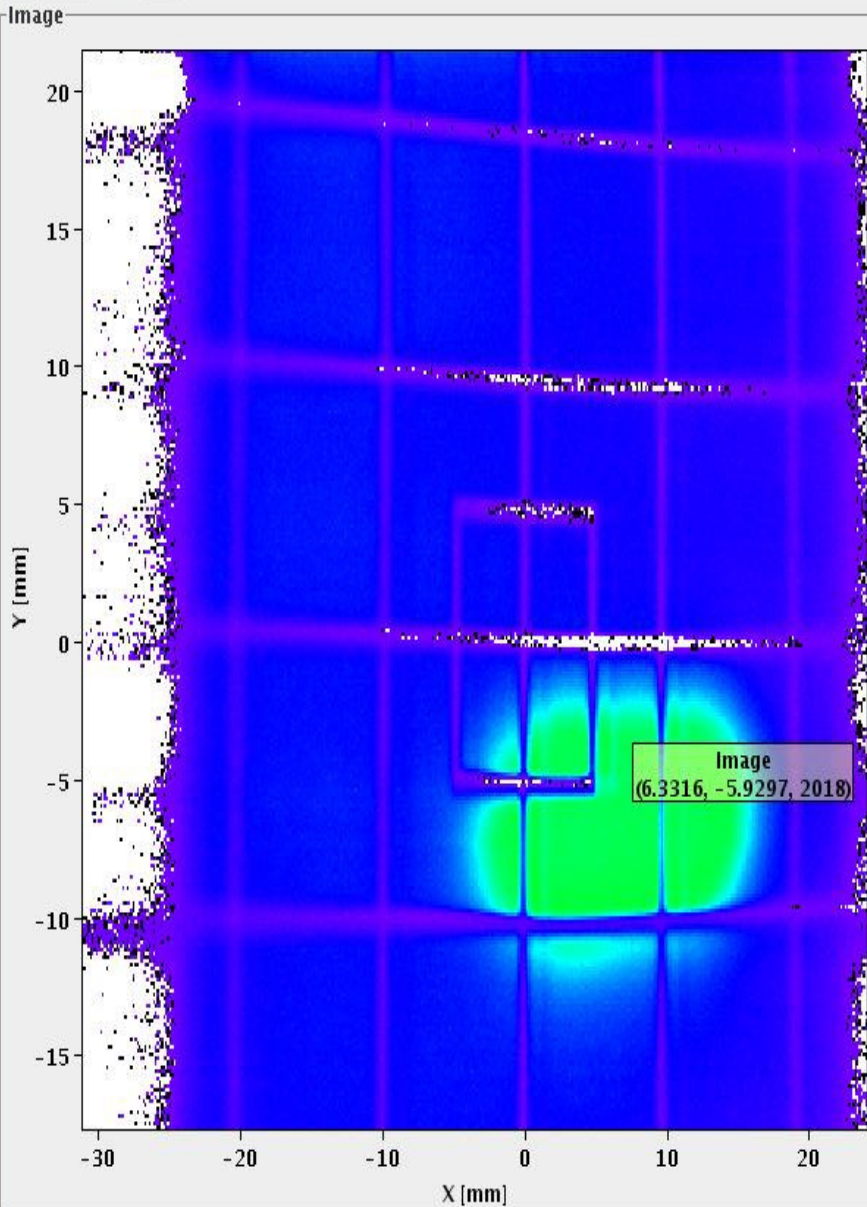


# Fitting of beam profiles - a few examples -

**Goran Skoro**

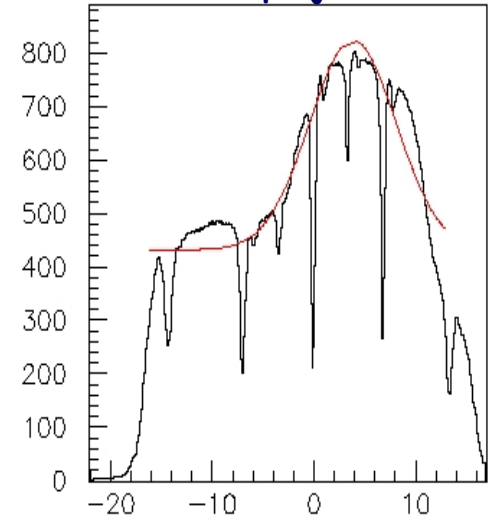
University of Sheffield

May 2008

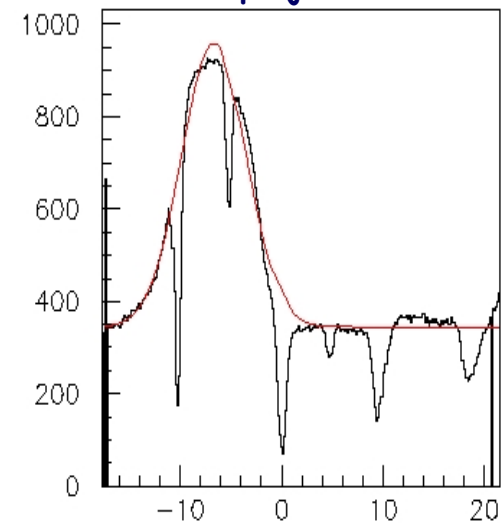


### MINUIT fit

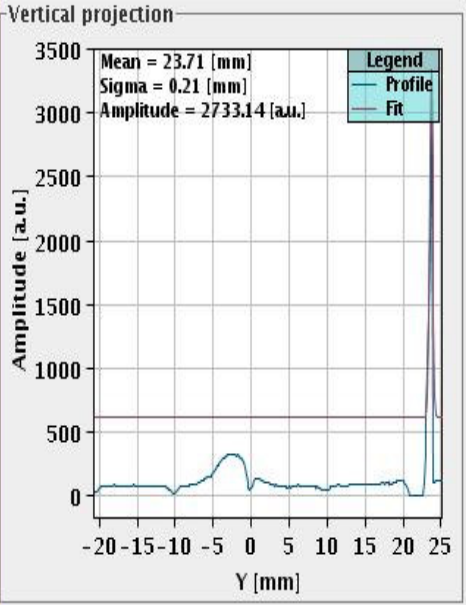
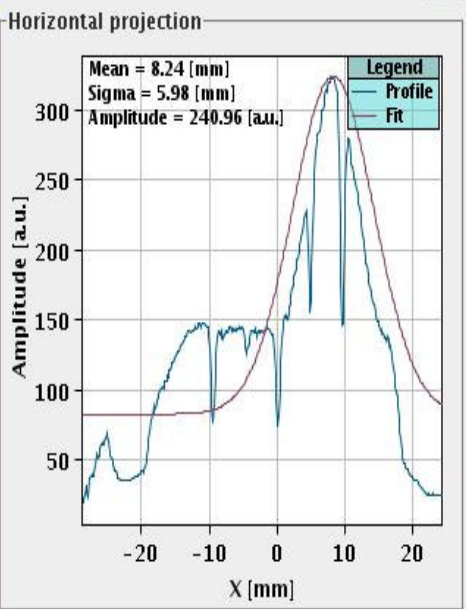
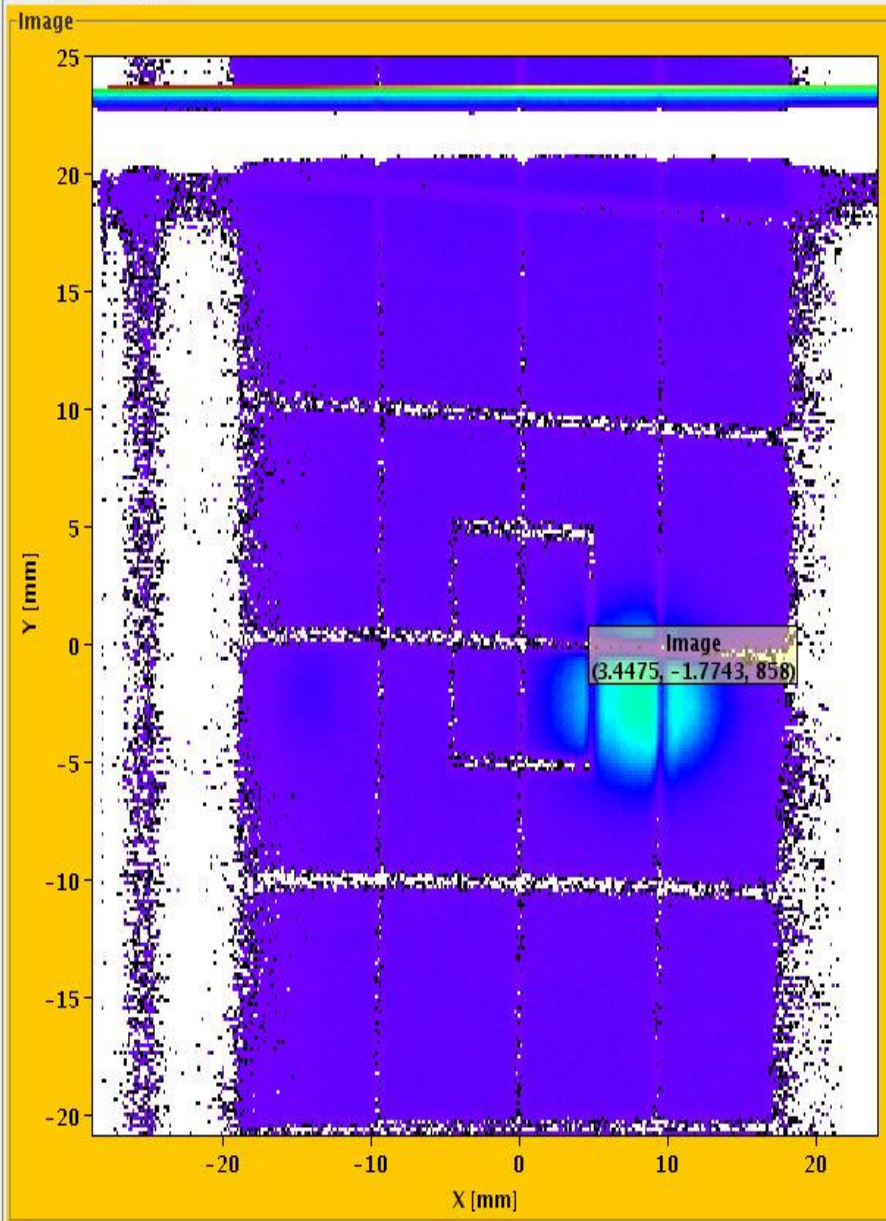
#### Horizontal projection\*



#### Vertical projection

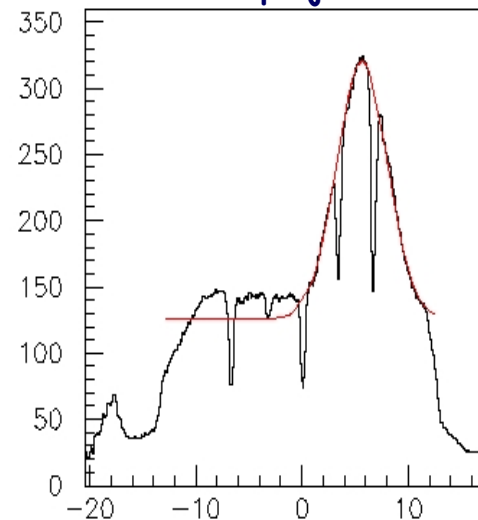


\* - corrected for the tilt of the screen ( for all plots)

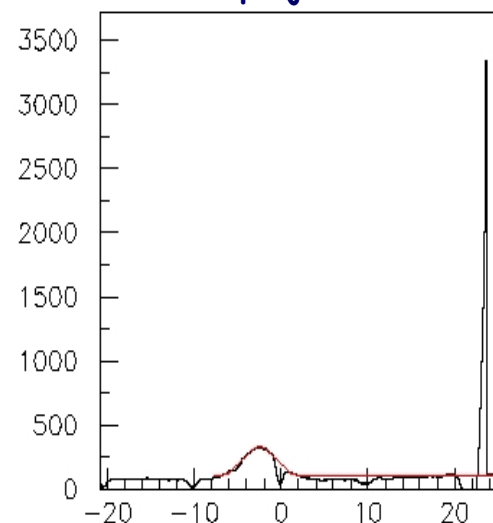


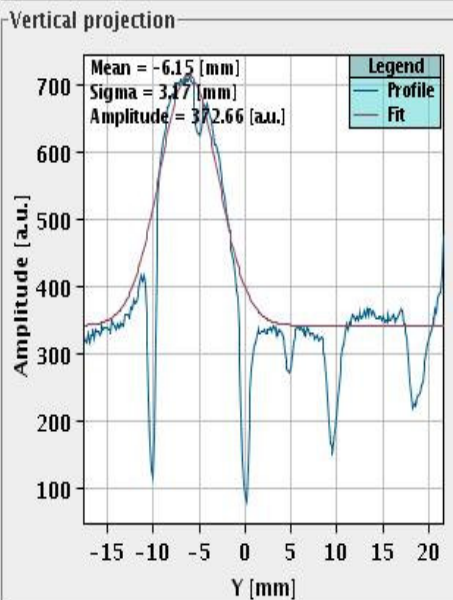
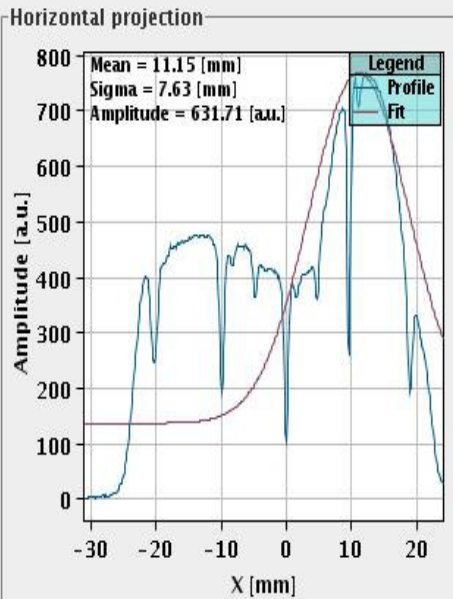
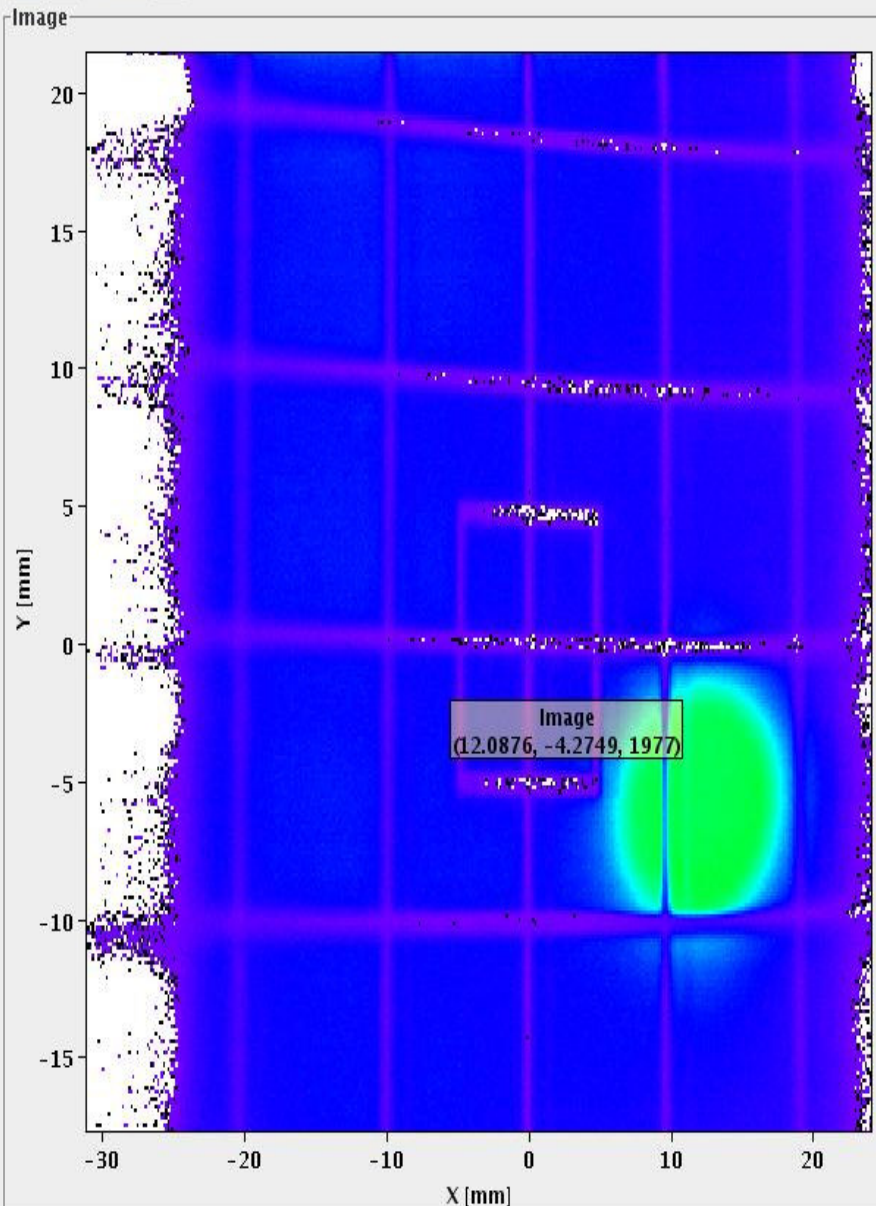
# MINUIT fit

## Horizontal projection



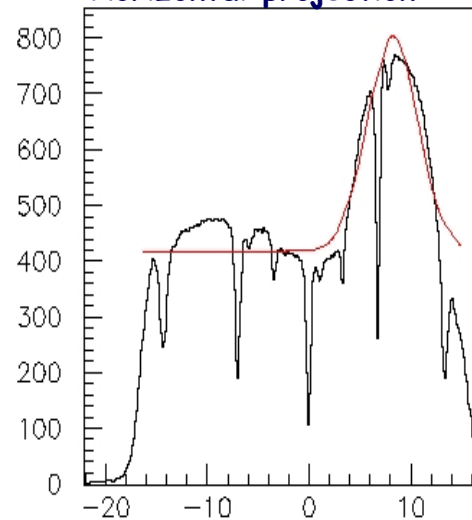
## Vertical projection



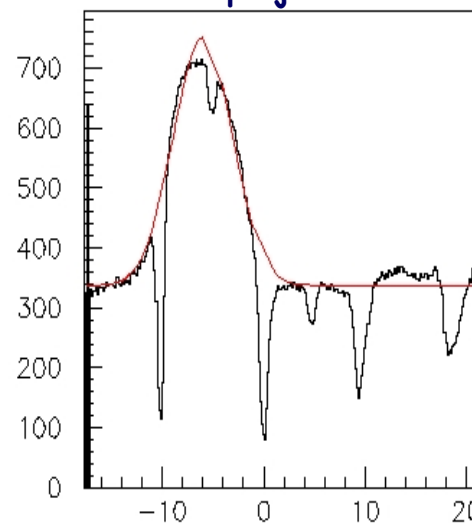


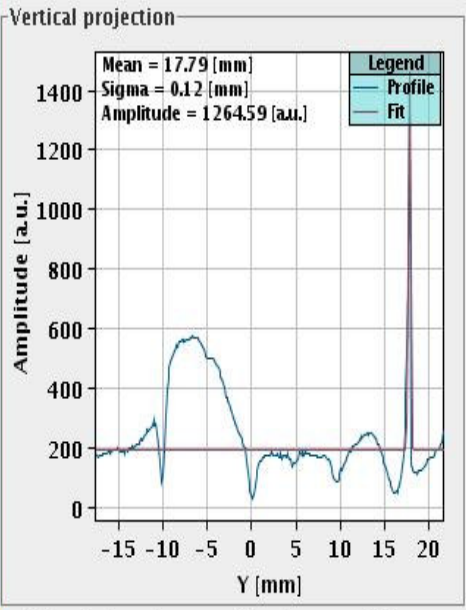
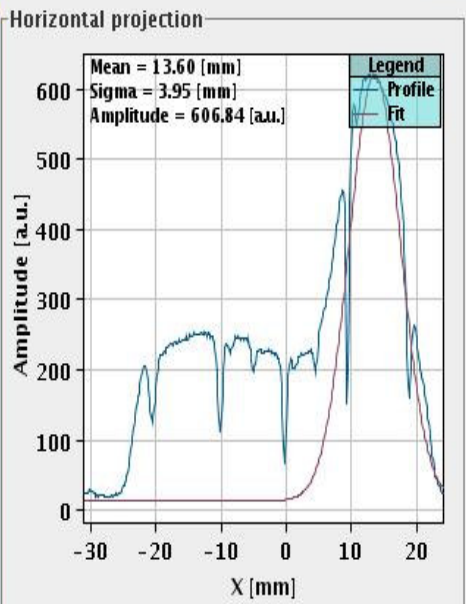
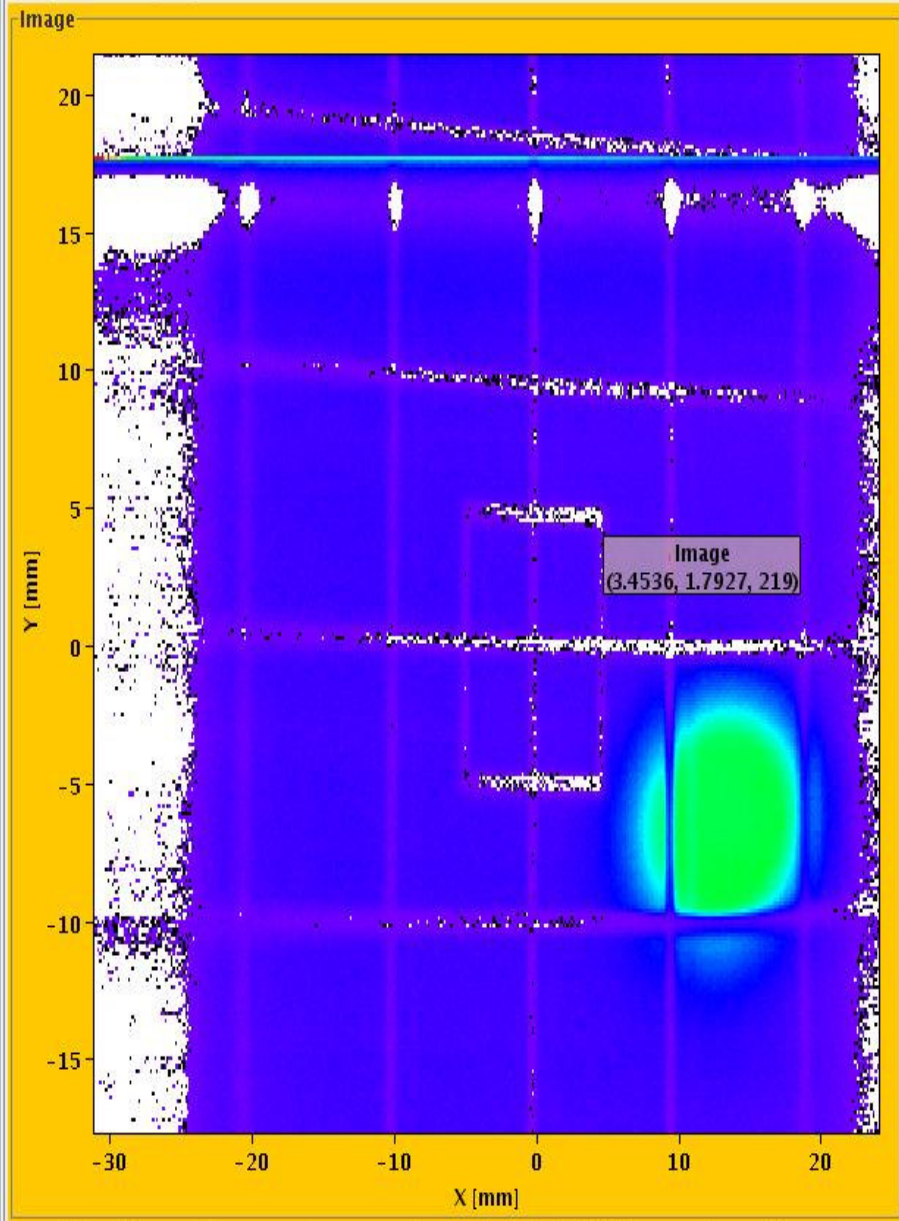
### MINUIT fit

#### Horizontal projection



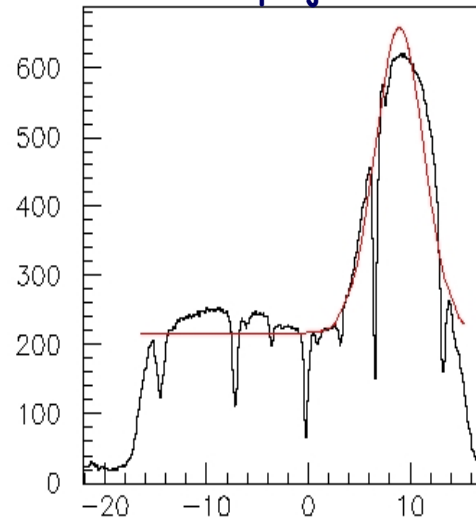
#### Vertical projection



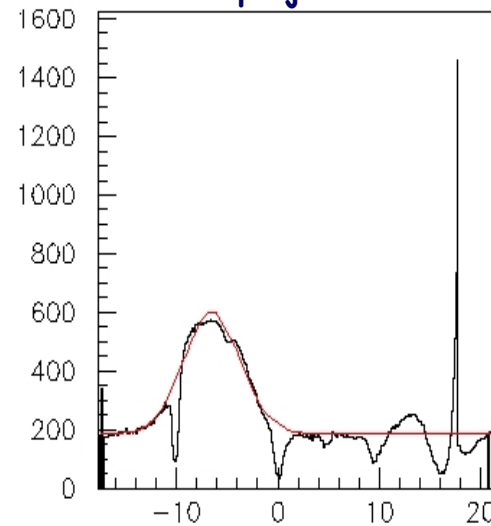


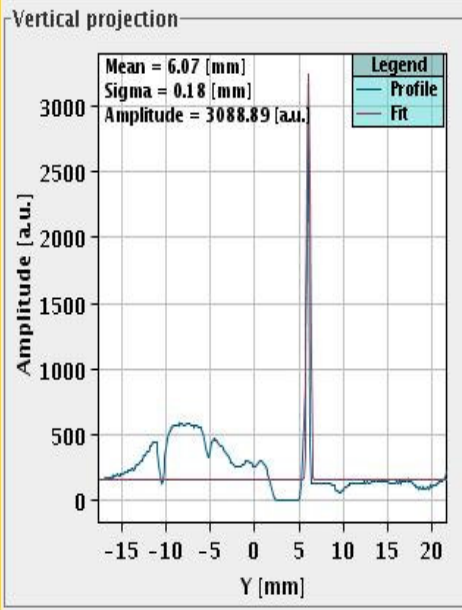
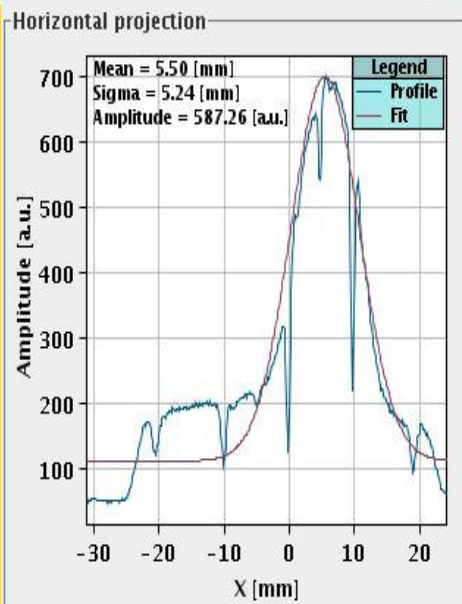
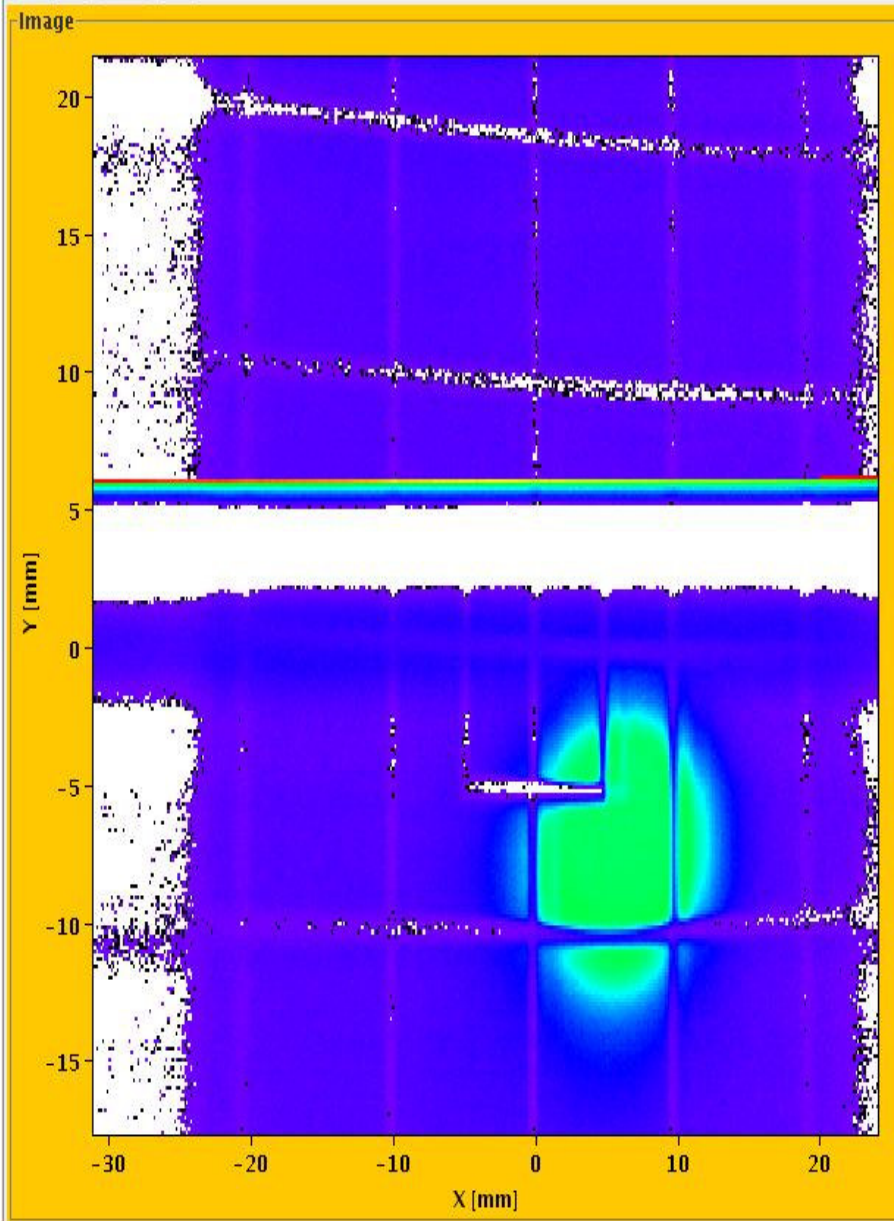
### MINUIT fit

#### Horizontal projection



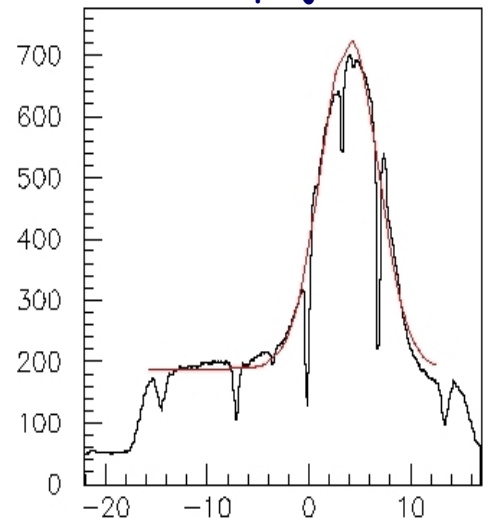
#### Vertical projection



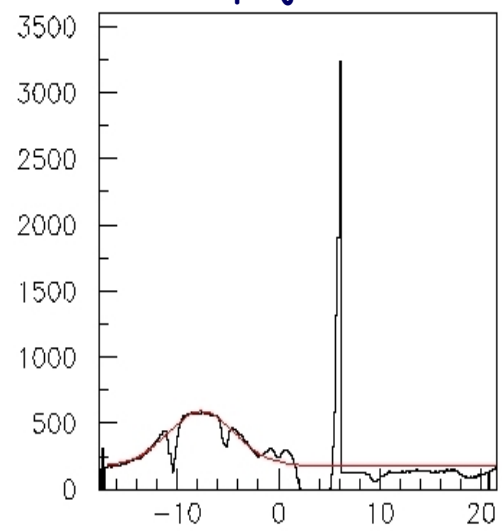


### MINUIT fit

#### Horizontal projection



#### Vertical projection



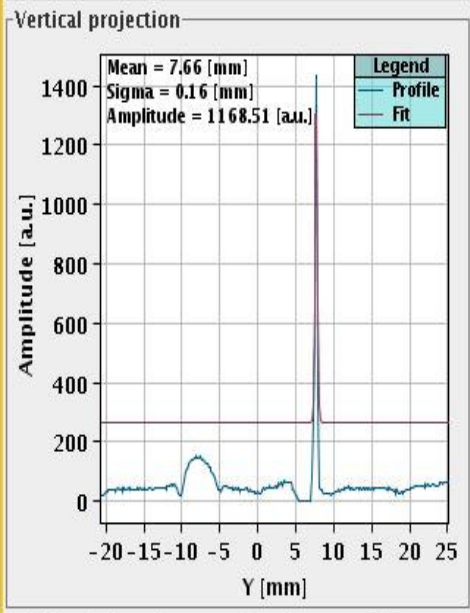
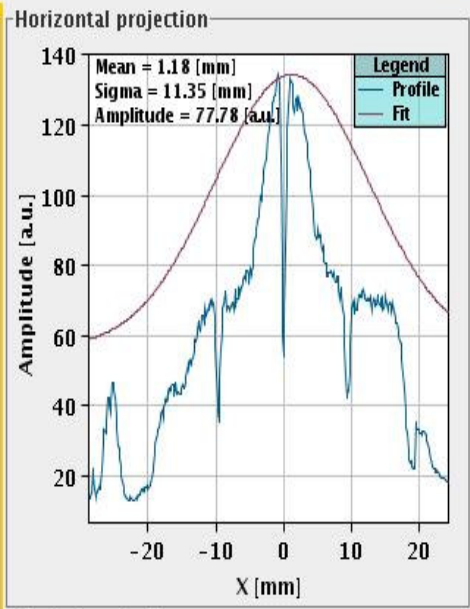
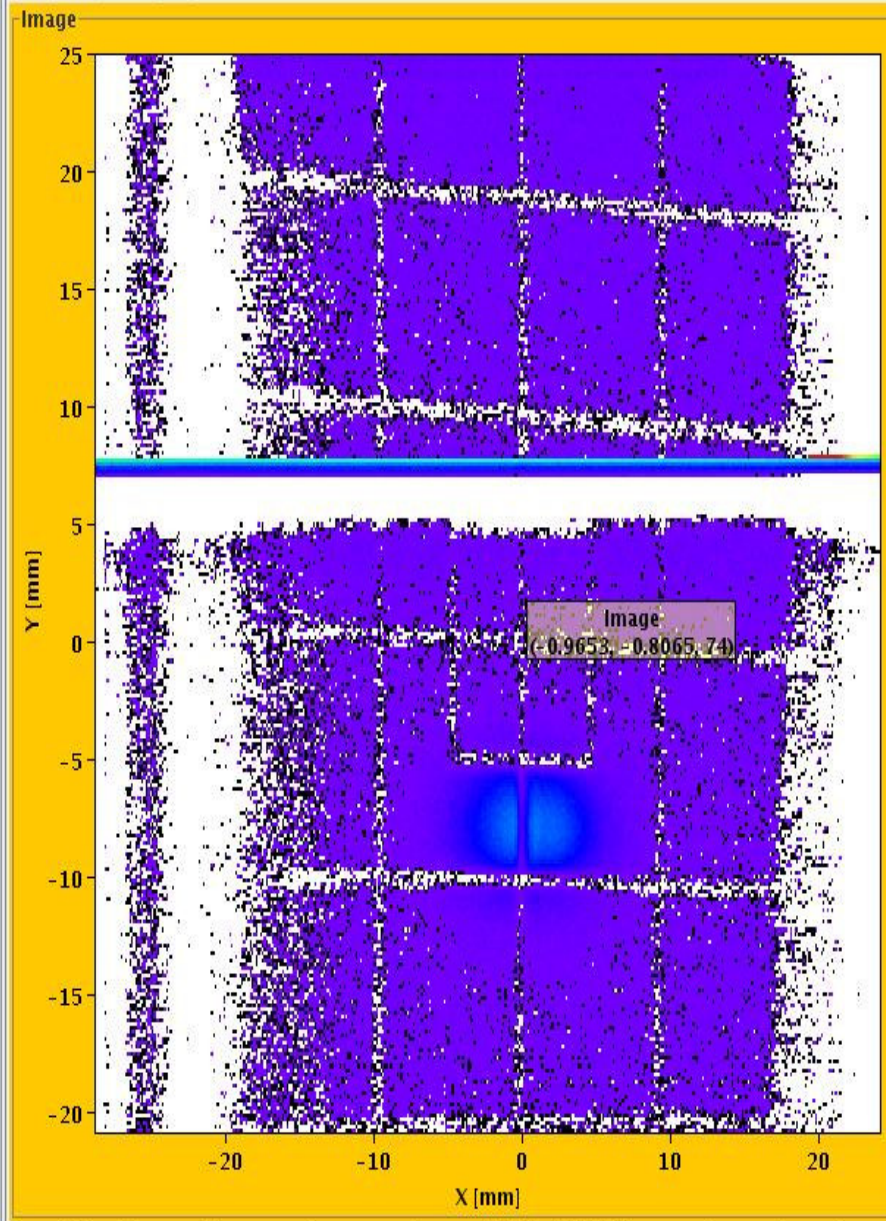
Acquisition Type: One extraction  
 Acquisition Number: 1

Camera Switch: RAD ON  
 Mire: OFF

Screen: Screen In  
 Filter: Out

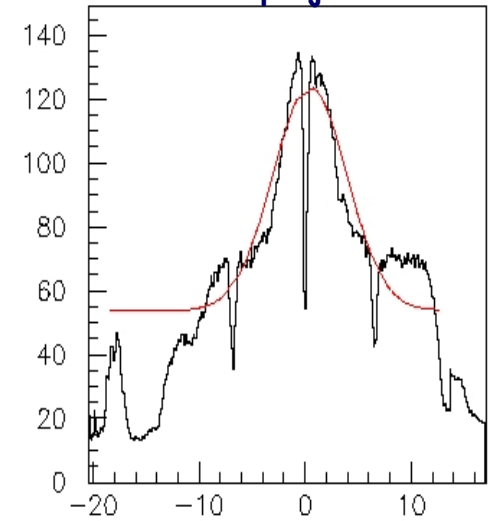
Video Gain: x 1

First Lamp: 0  
 Second Lamp: 0

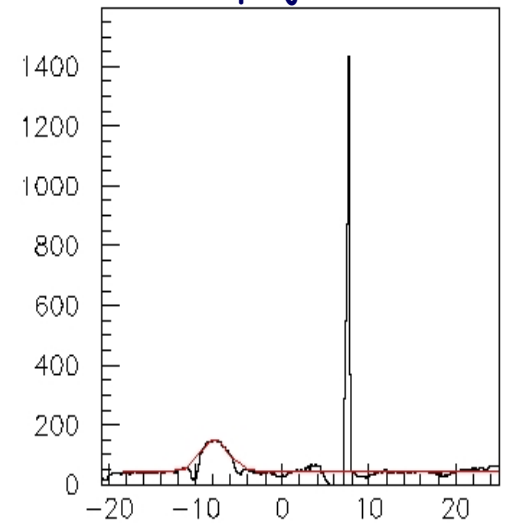


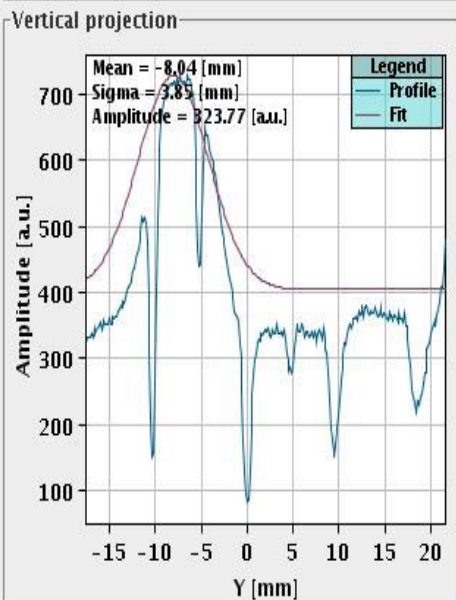
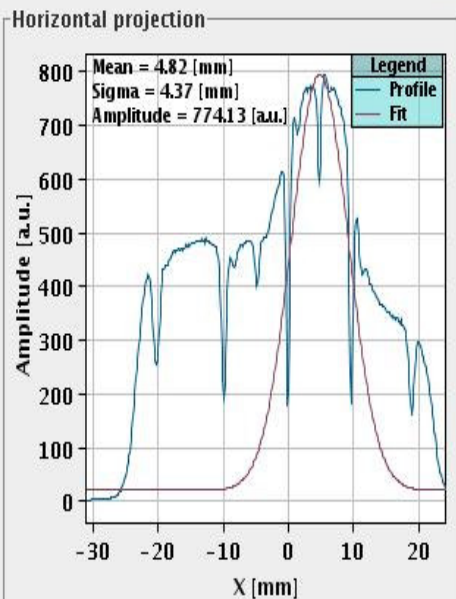
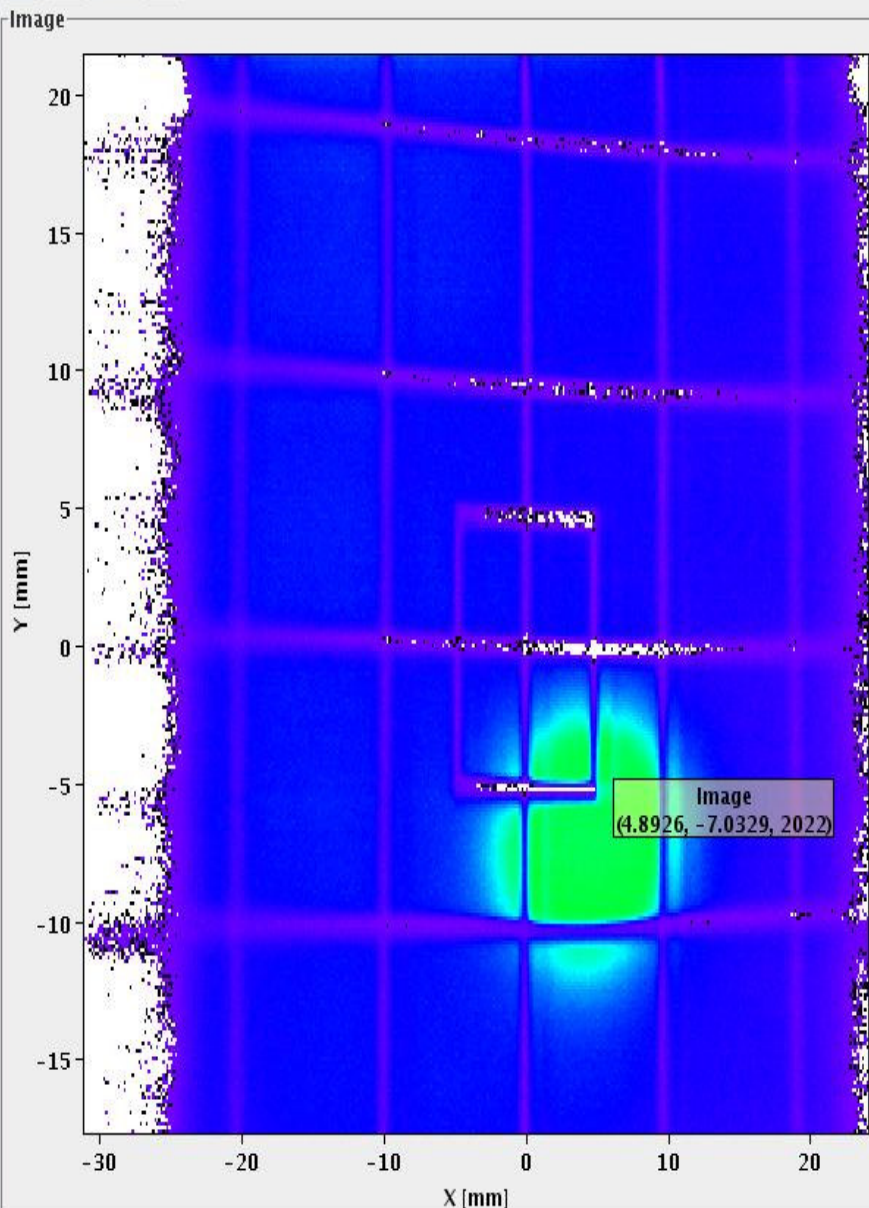
### MINUIT fit

#### Horizontal projection



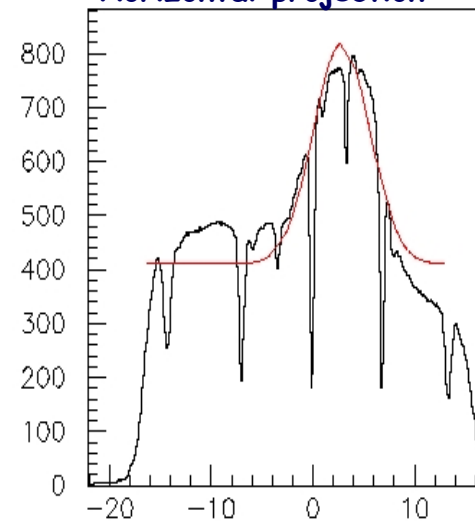
#### Vertical projection



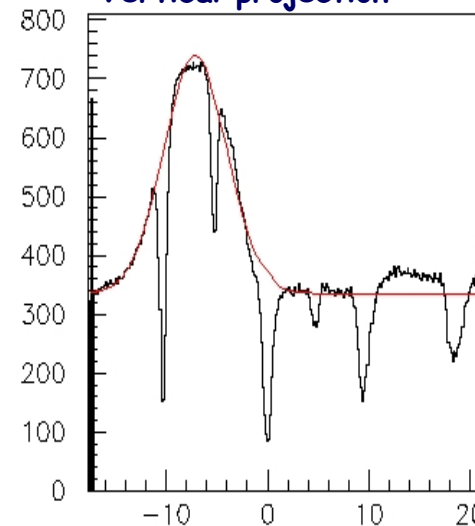


### MINUIT fit

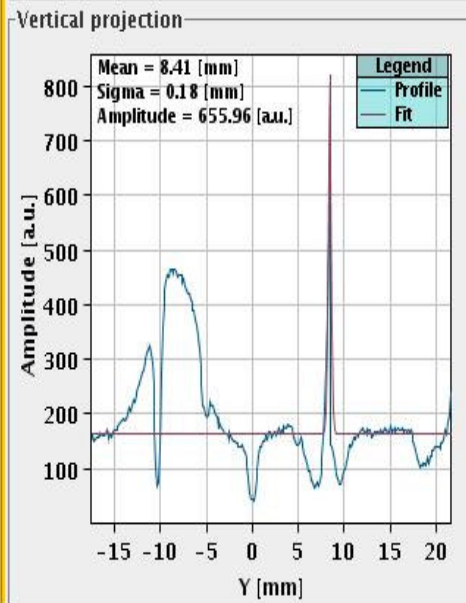
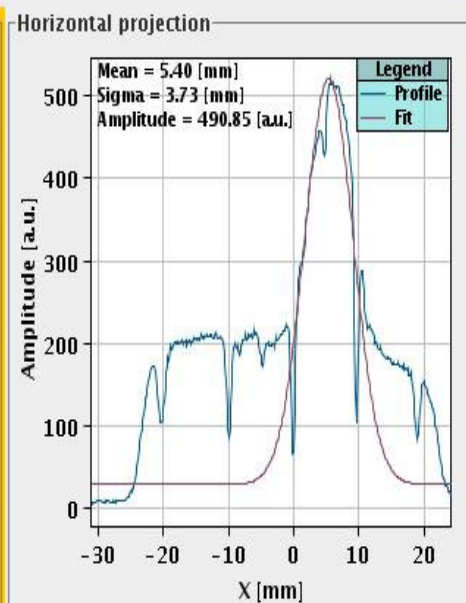
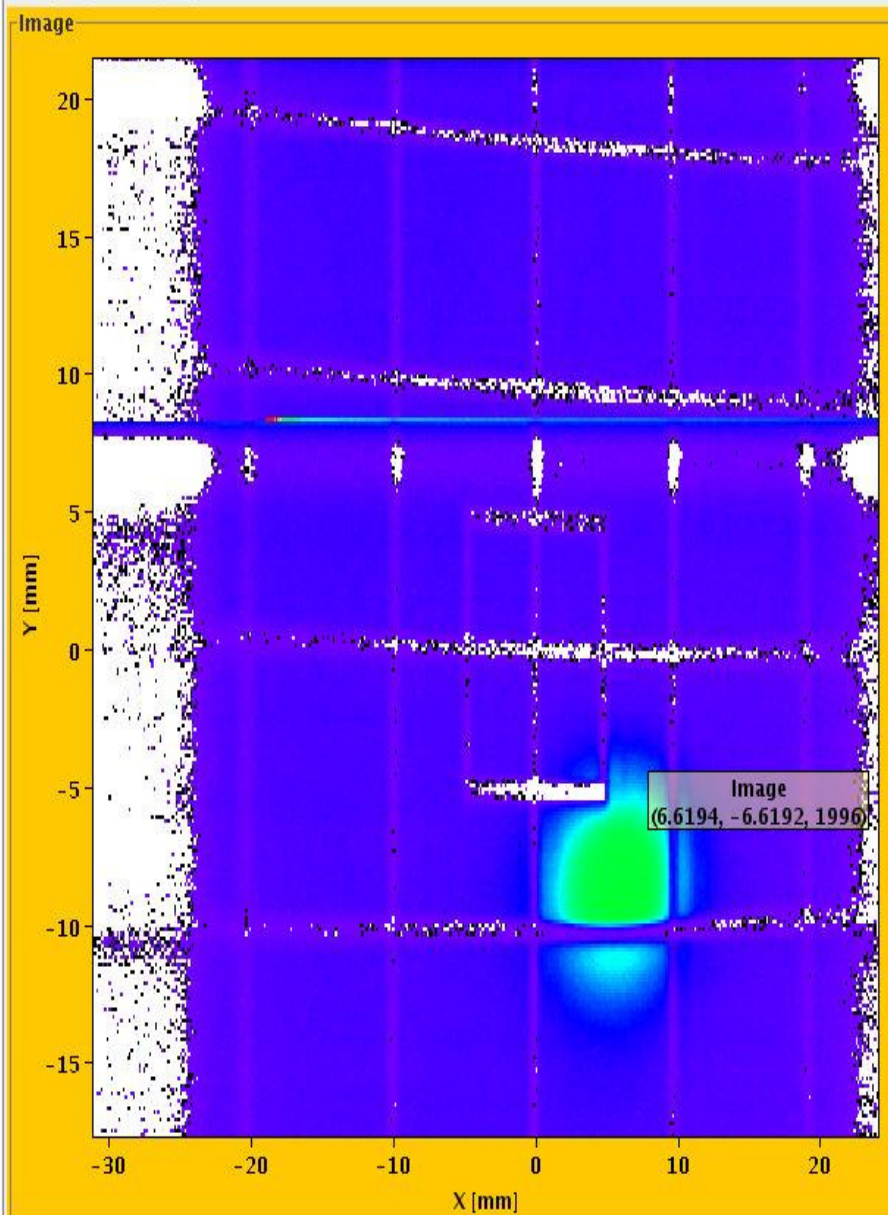
#### Horizontal projection



#### Vertical projection

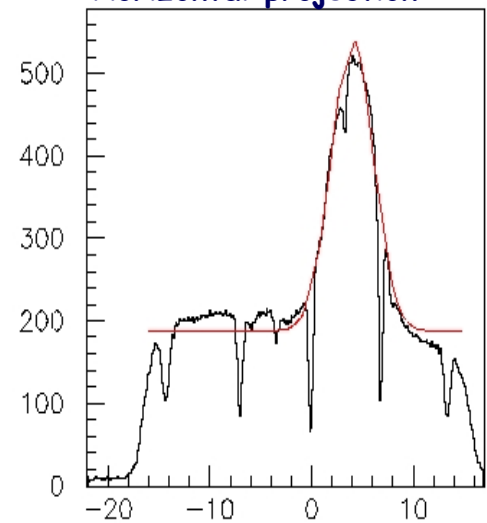




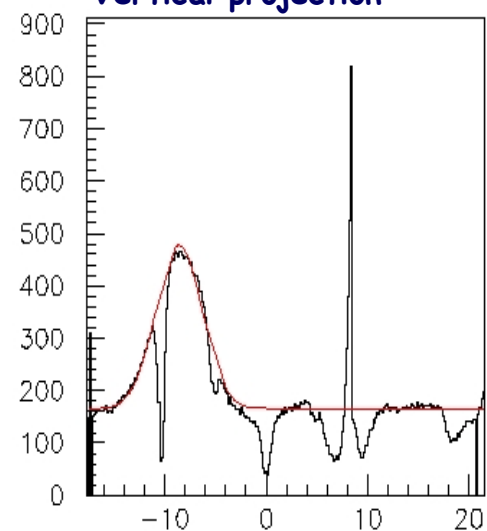


## MINUIT fit

### Horizontal projection



### Vertical projection



## Comments, Q & A:

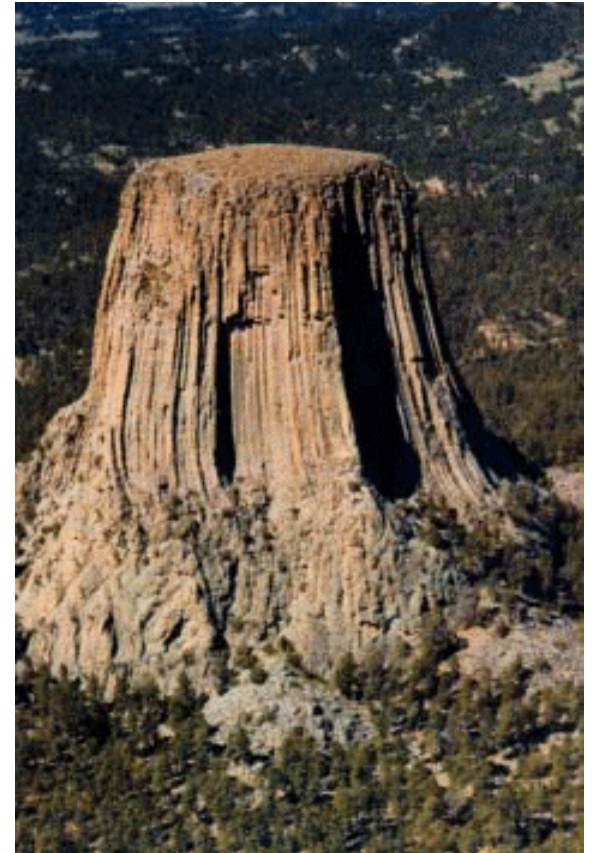
H. Kirk: Goran, The examples you show are for the fitting of the spot projections in each plane. This projection contains, of course, the saturated pixels. Although the results can probably give a good rendering of the beam's  $x$  and  $y$  positions, I'm unsure of its value in determining beam spot size.

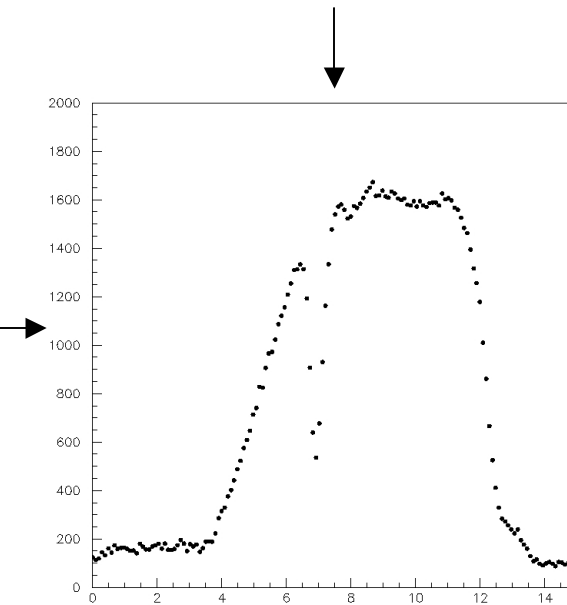
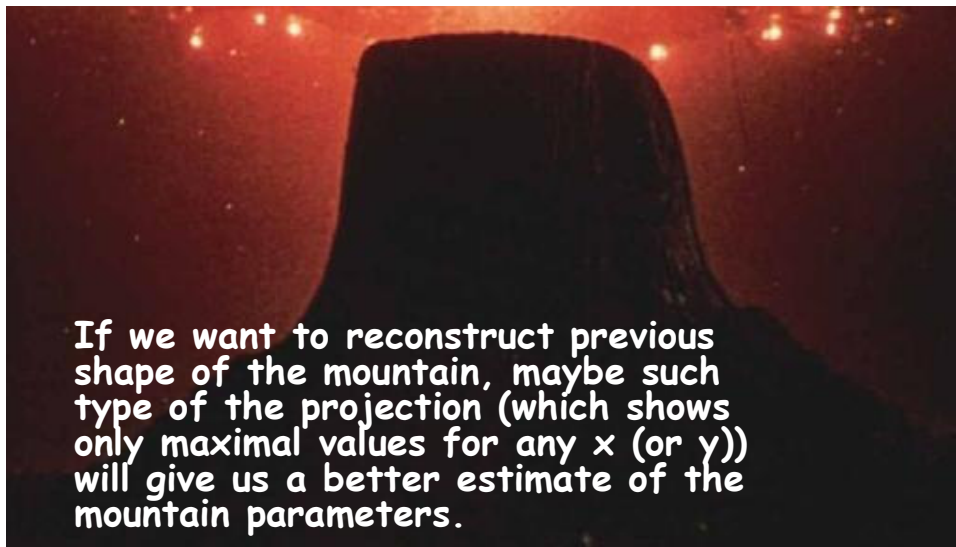
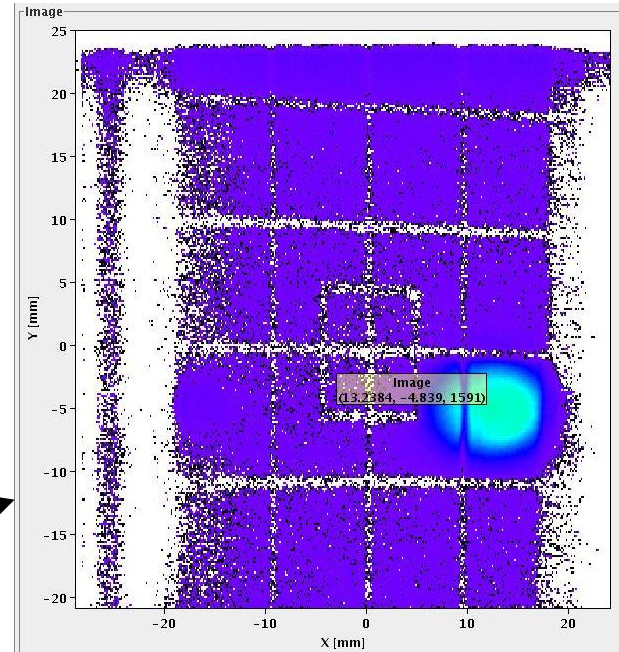
My intention with this set of examples was only to test my fitting algorithm (to see can I avoid the gaps). And to have the results for cross-checking after I try a different approach for extracting the beam spot size.

H. Kirk: Can you fit the beam in  $x$  for example with slices in  $y$ . Does a slice in  $y$  outside of the saturated pixel region have value?

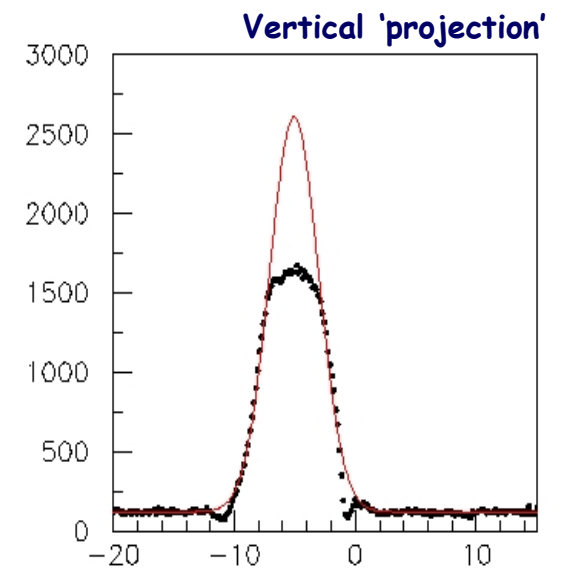
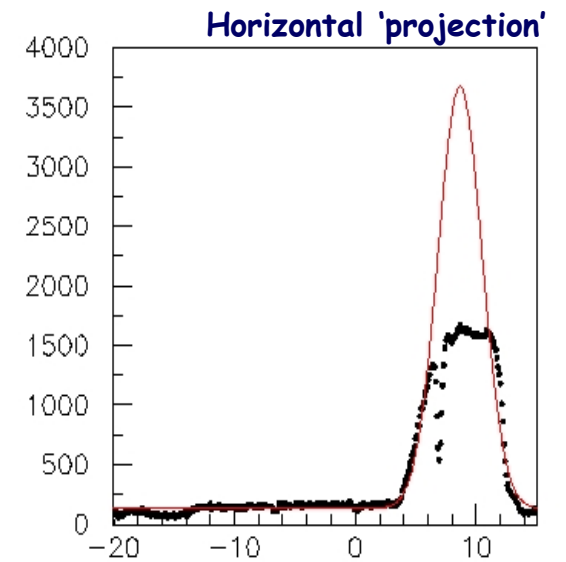
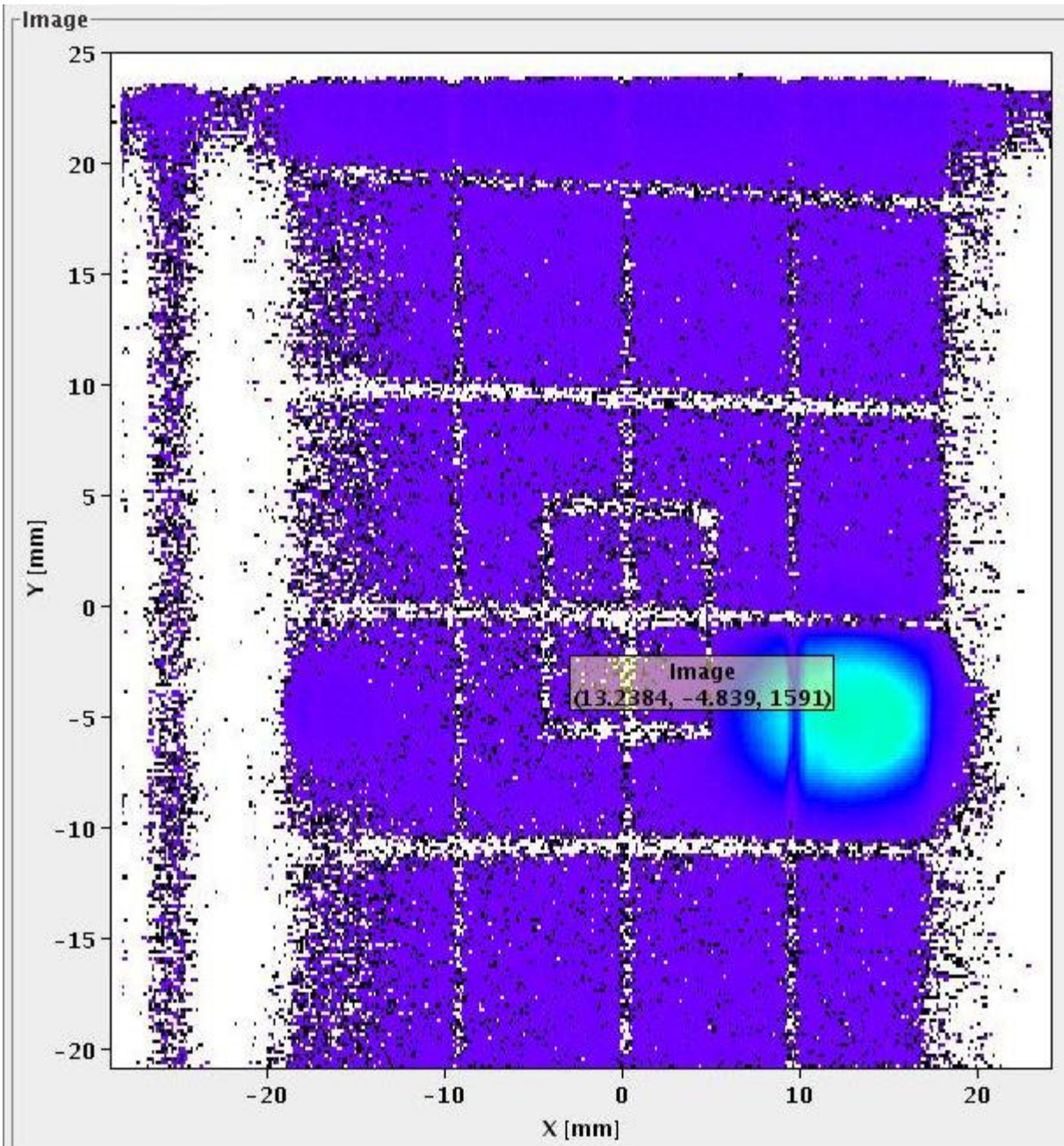
Yes, I can fit 'slices' (and they have values outside the saturated region). But I have tried a different approach (which could be identical to the slicing of the distribution).

Generally, what we expect to have is a distribution which looks like the Devils Tower in Wyoming. So, we can rewrite the script for "Close Encounters of the Third Kind" assuming that the mountain was double Gaussian in shape before the 'visitors' removed the top in order to land.





The following 2 slides show first attempts to fit such "projections" of the beam spot.



Comparison with previous approach: There is practically no difference between x/y positions values (there are within errors). The widths of the distributions are different (significantly for x).

