

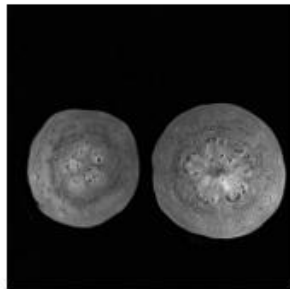
MRI Course HW2

四電機四甲 B10907034 王信舜

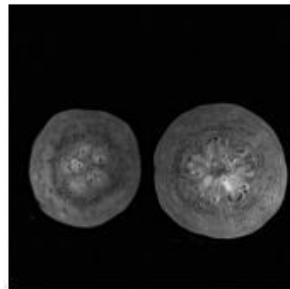
Raw Images

Image 1

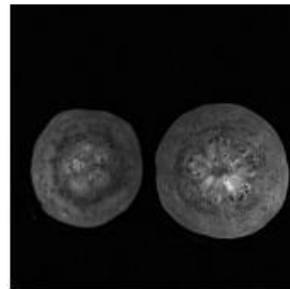
TE = 13.60



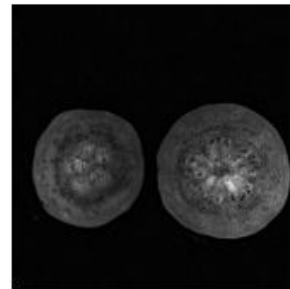
TE = 27.20



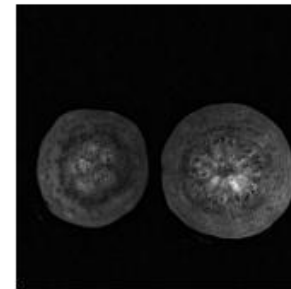
TE = 40.80



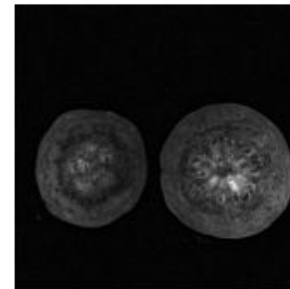
TE = 54.40



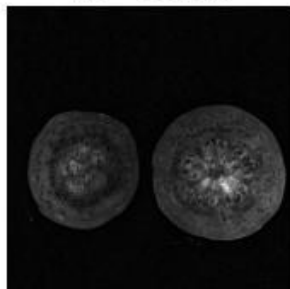
TE = 68.00



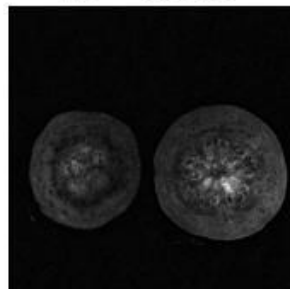
TE = 81.60



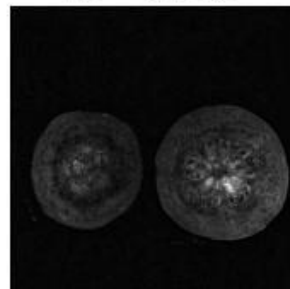
TE = 95.20



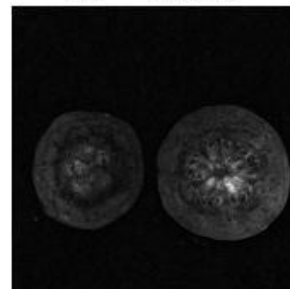
TE = 108.80



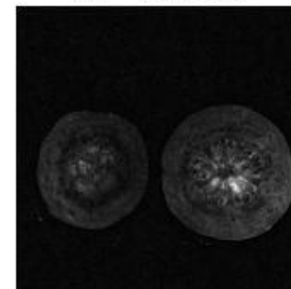
TE = 122.40



TE = 136.00



TE = 149.60



TE = 163.20

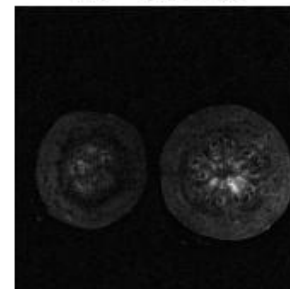
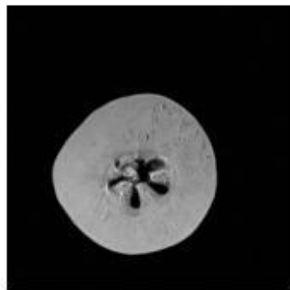


Image 2

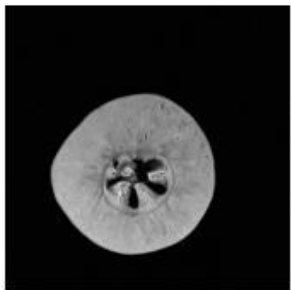
TE = 13.60



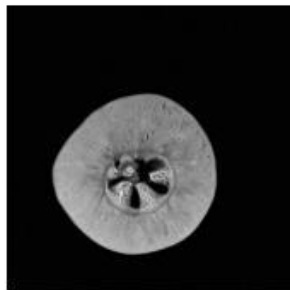
TE = 27.20



TE = 40.80



TE = 54.40



TE = 68.00



TE = 81.60



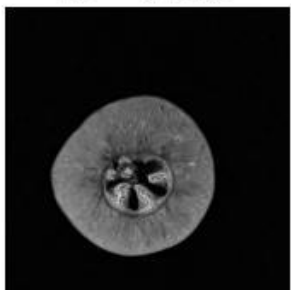
TE = 95.20



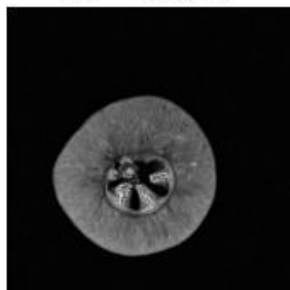
TE = 108.80



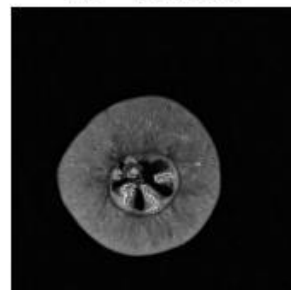
TE = 122.40



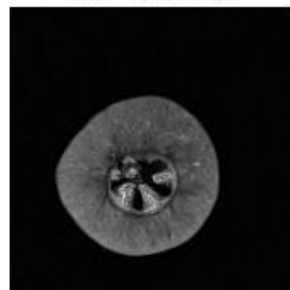
TE = 136.00



TE = 149.60



TE = 163.20



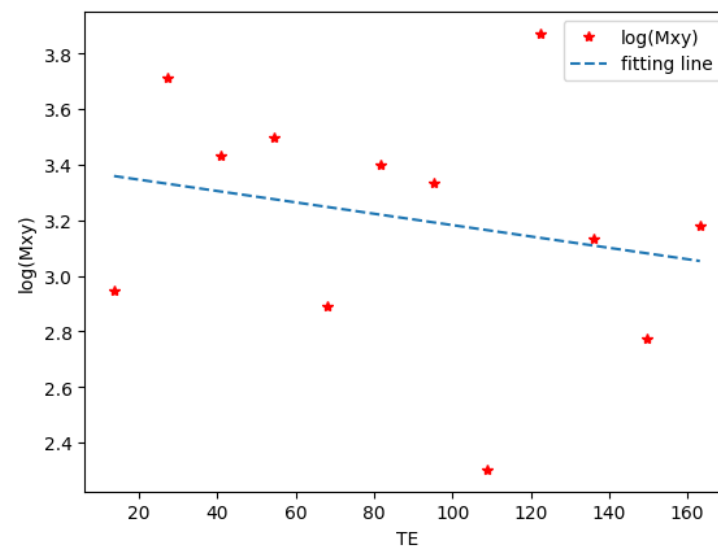
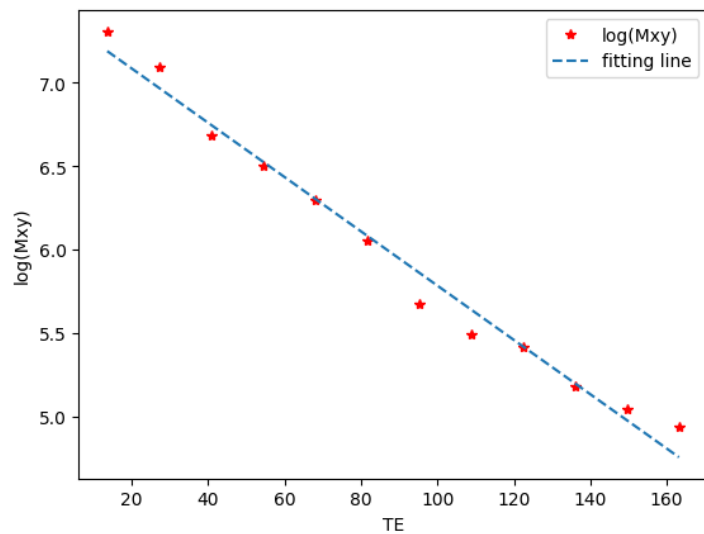
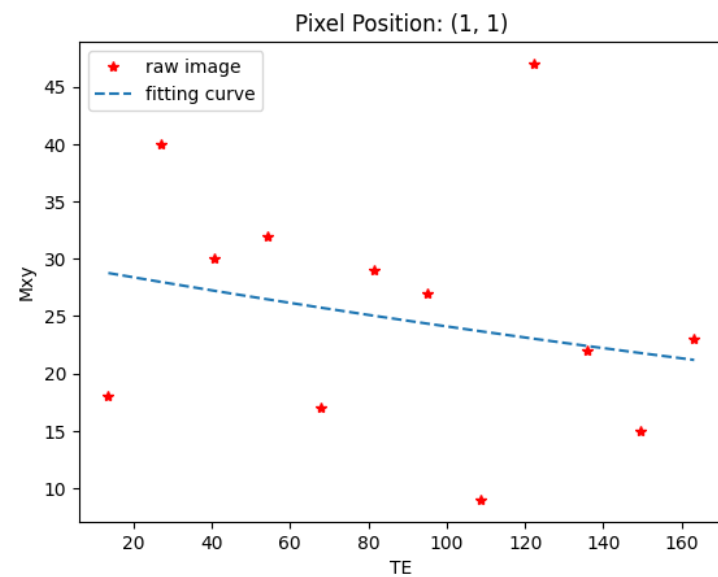
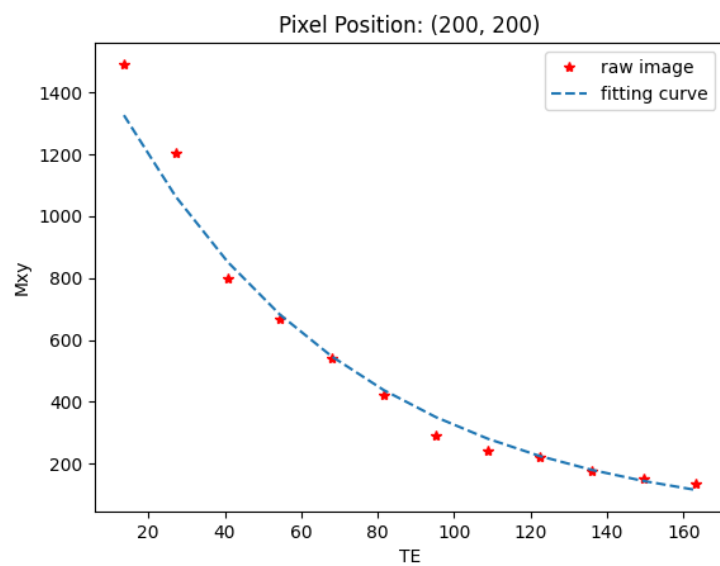
scipy.stats.linregress()

$$\log_e Mxy = \log_e(M_0) + \left(\frac{-1}{T2}\right) TE$$

$$Y = \beta + \alpha x$$

$$M_0 = e^{\beta}$$

$$T2 = \frac{-1}{\alpha} \text{ if } |\alpha| > \frac{1}{160} \text{ else } 0$$



Preprocessing

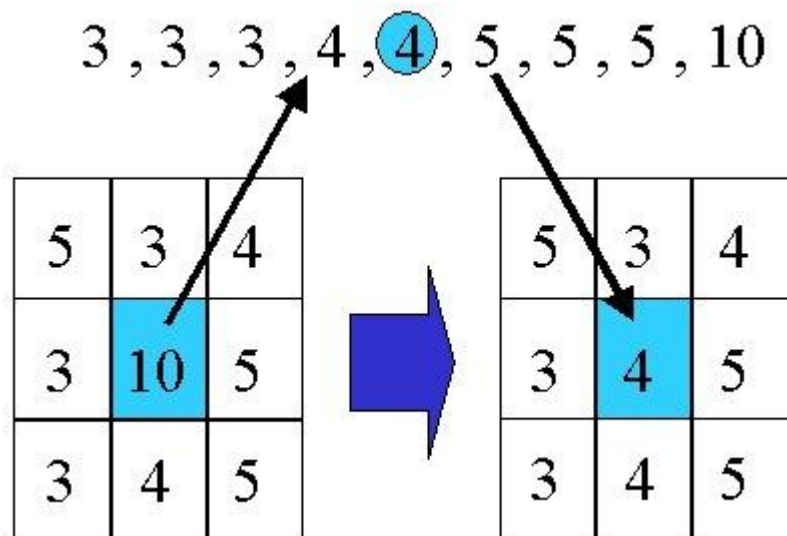
目標: 去除背景雜訊

各種Blur

Average Blur

$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$
$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$
$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$

Median Blur

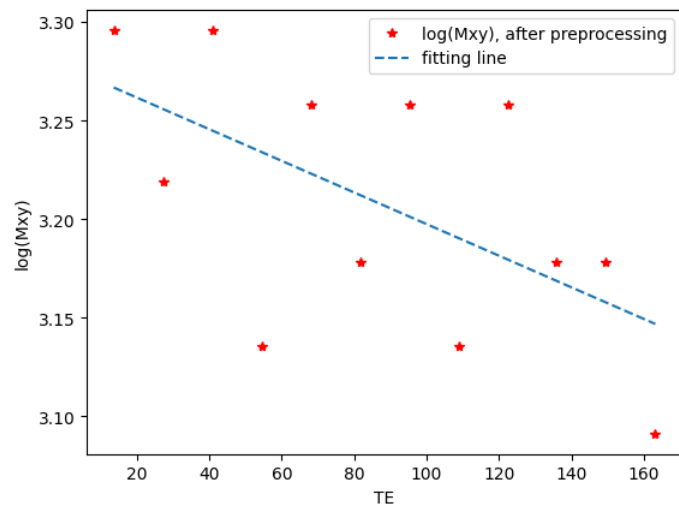
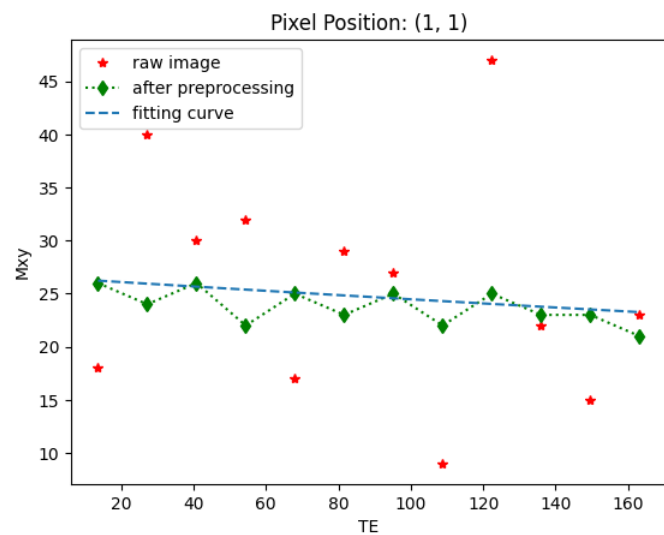


Gaussian Blur

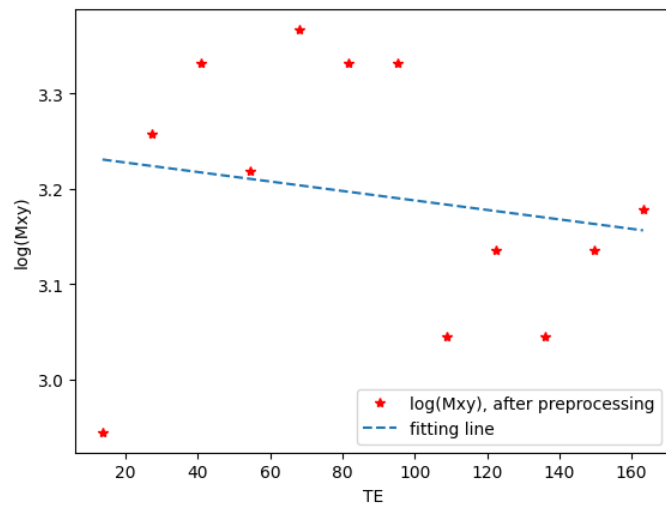
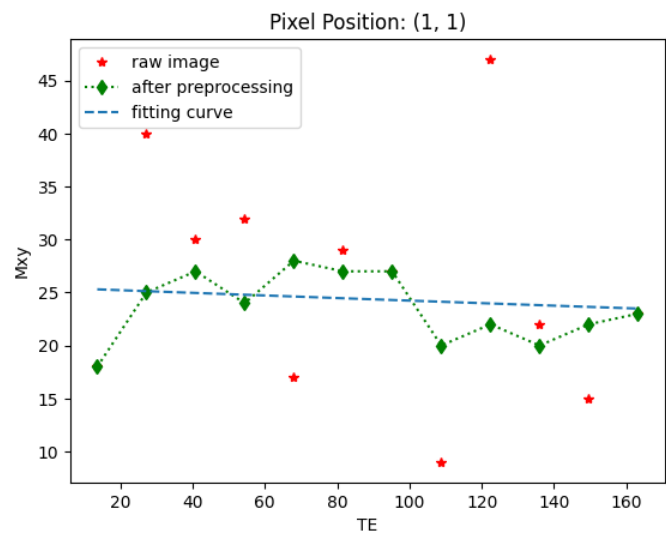
$\frac{1}{16} \times$

1	2	1
2	4	2
1	2	1

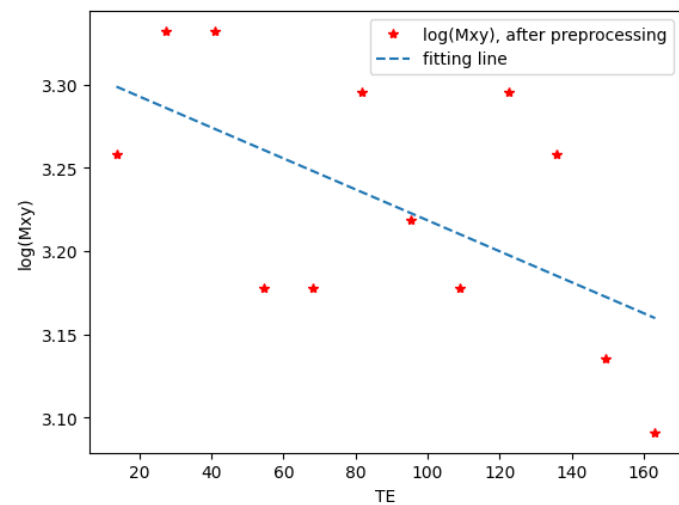
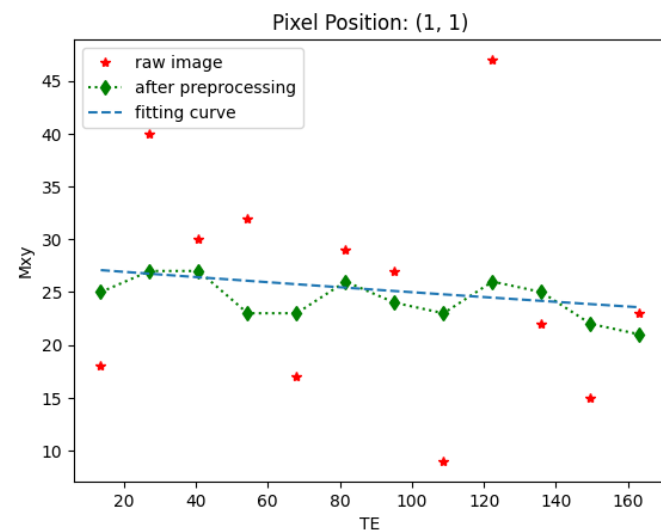
Average Blur



Median Blur



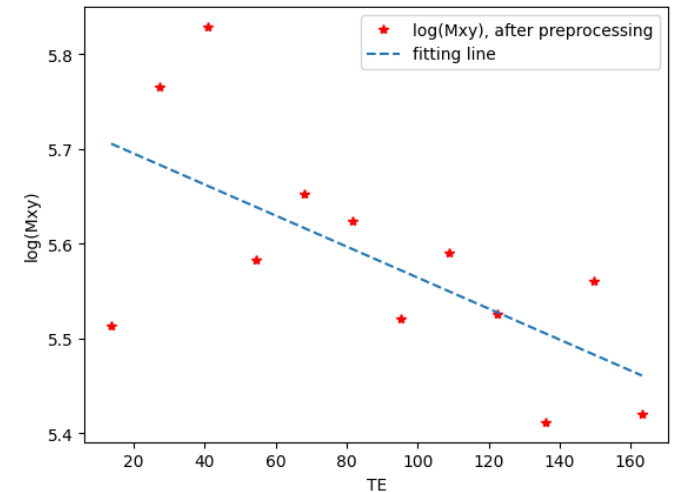
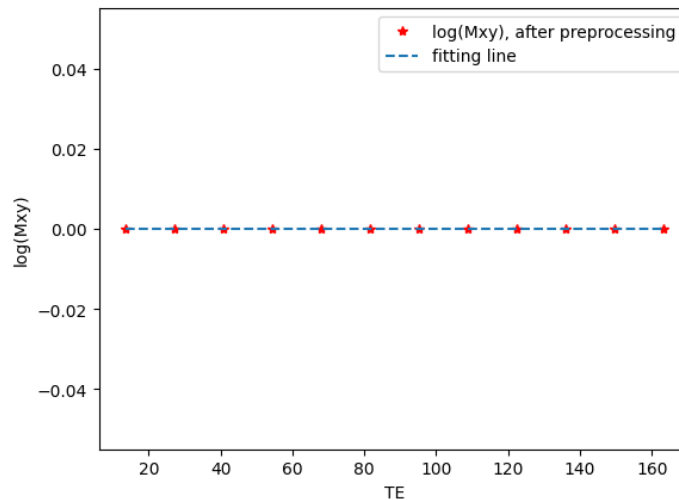
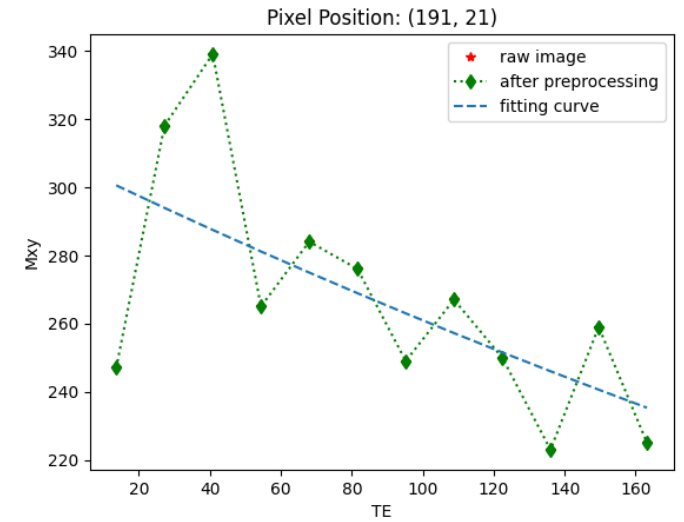
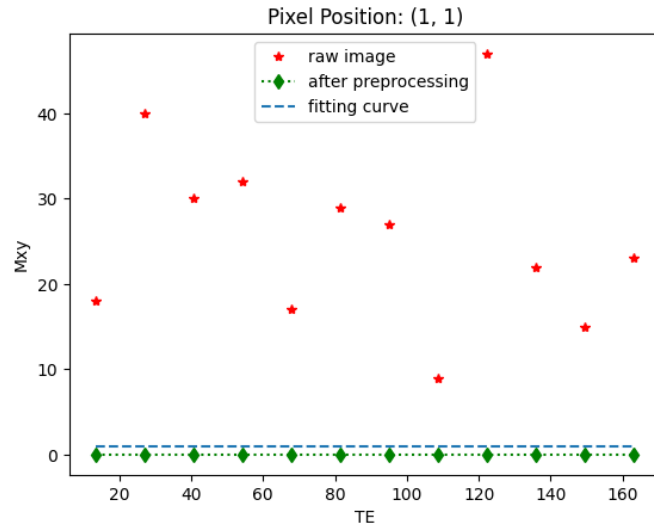
Gaussian Blur



Mean小於一定值, 該pixel value=1

$$\text{if } \sum_{i=1}^{12} \frac{I(i, x, y)}{12} < 100$$

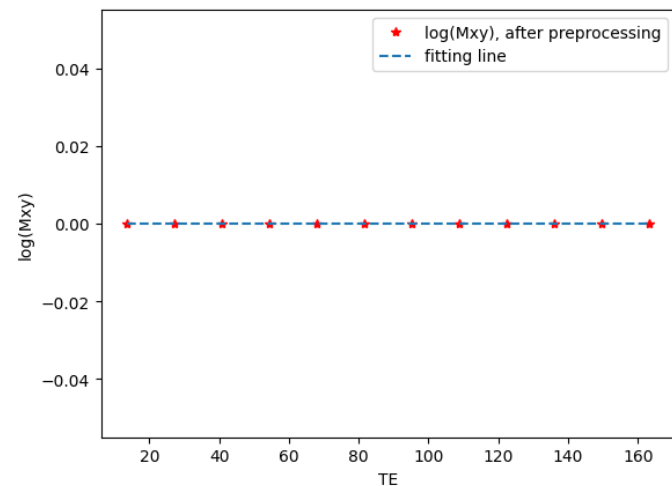
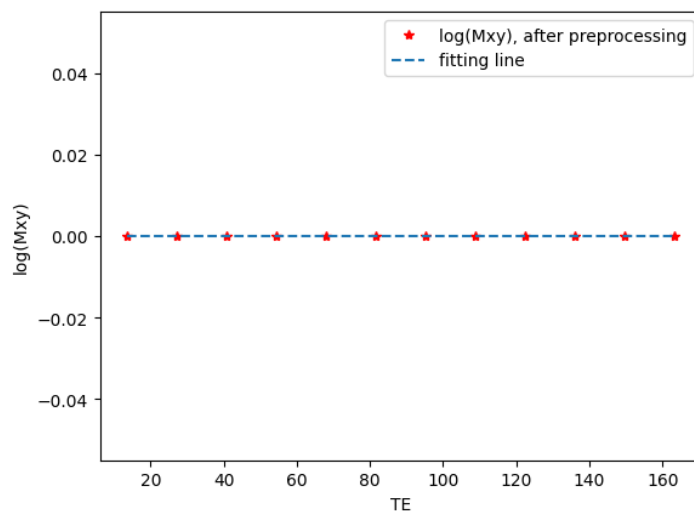
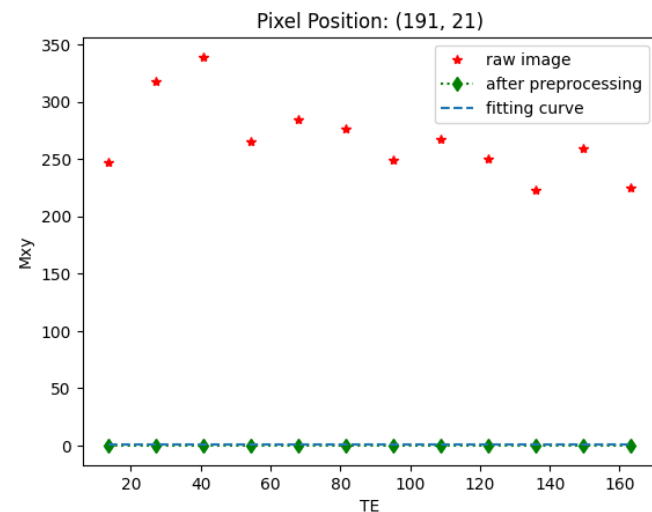
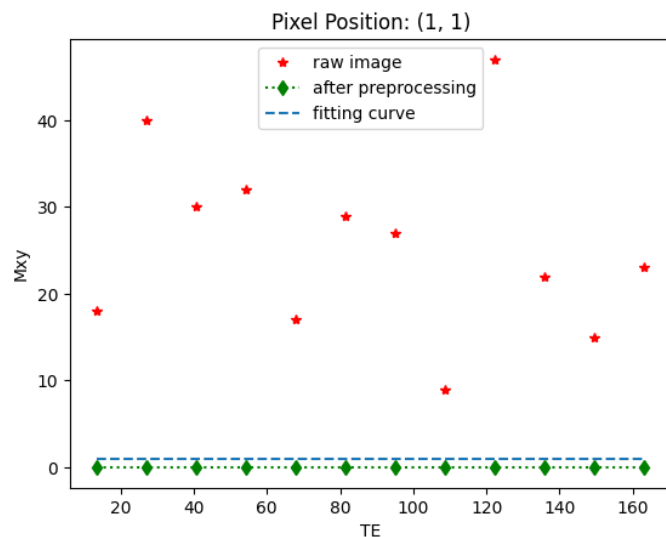
then $I(i, x, y) = 1$,
 $i = 1, 2, \dots, 12$



Std小於一定值, 該pixel value=1

if $I(i, x, y).std() < 100$

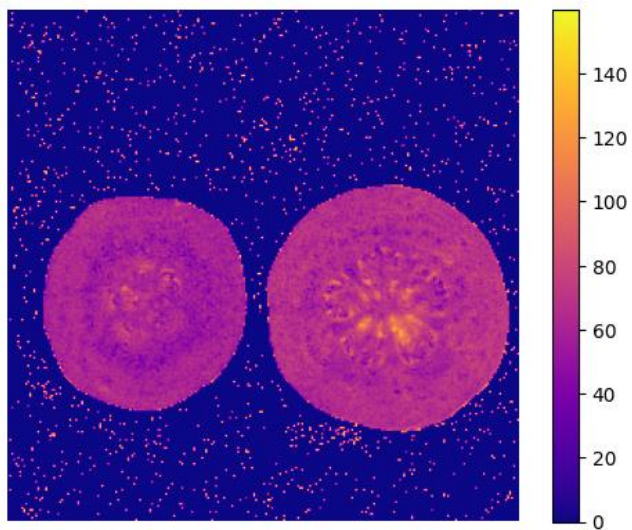
*then $I(i, x, y) = 1,$
 $i = 1, 2, \dots, 12$*



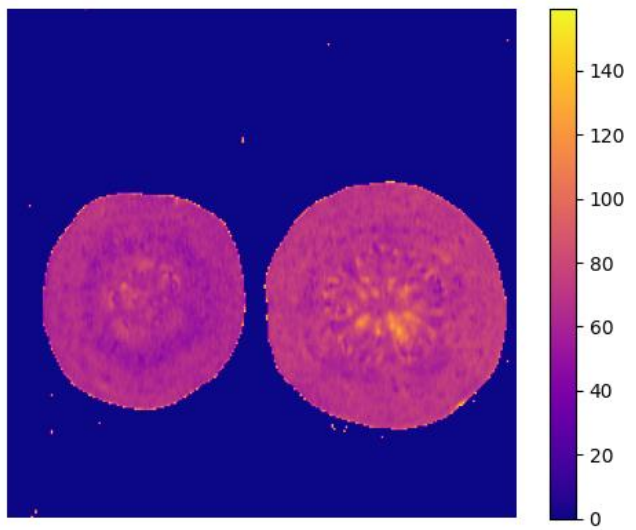
Average RMSE (only count when T2 > 0)						
Fitting method		linregress				
Preprocessing Method		Average Blur	Median Blur	Gaussian Blur	Std theshold	Mean theshold
Image	兩顆	70.037	64.917	64.297	52.251	52.171
	一顆	83.547	73.037	74.681	59.707	59.567

T2 Map

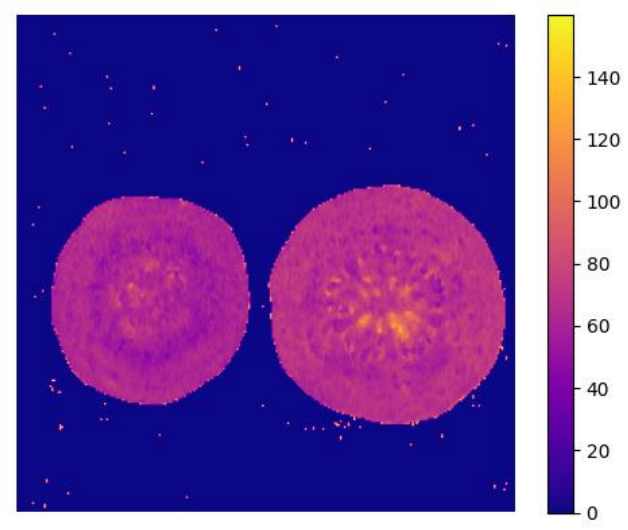
Raw



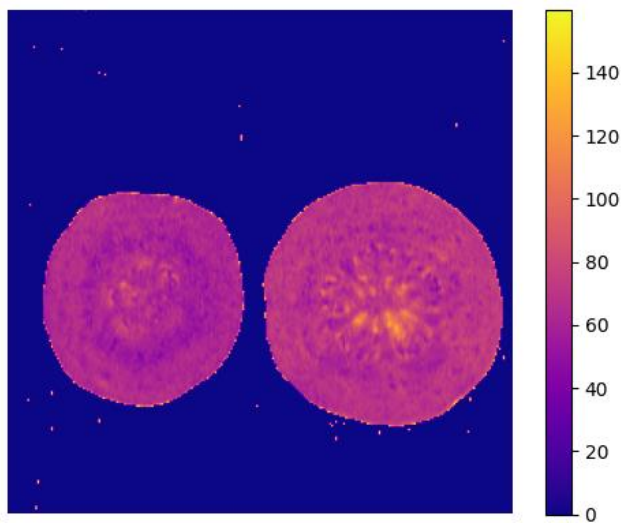
Average Blur



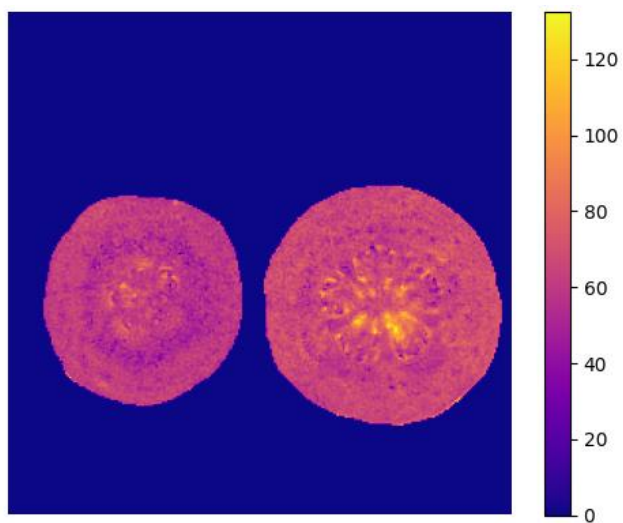
Median Blur



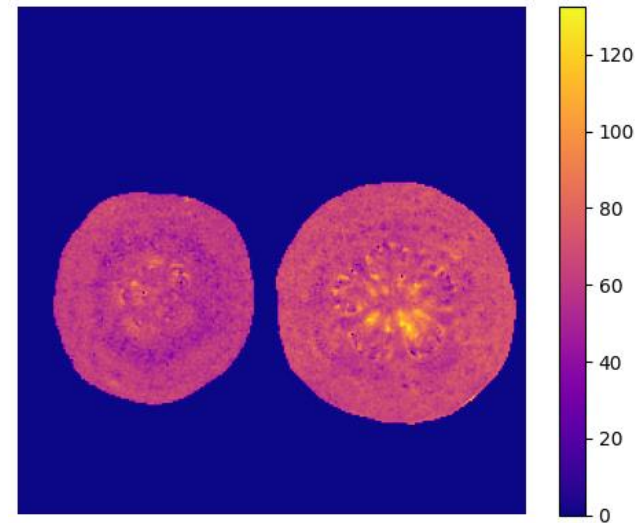
Gaussian Blur



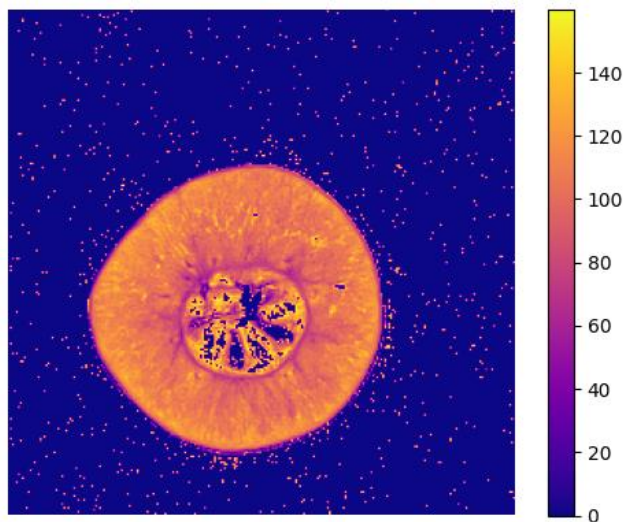
Mean Threshold



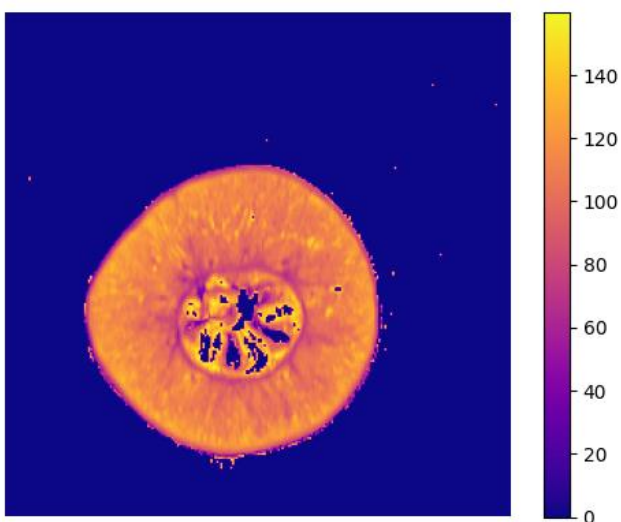
Std Threshold



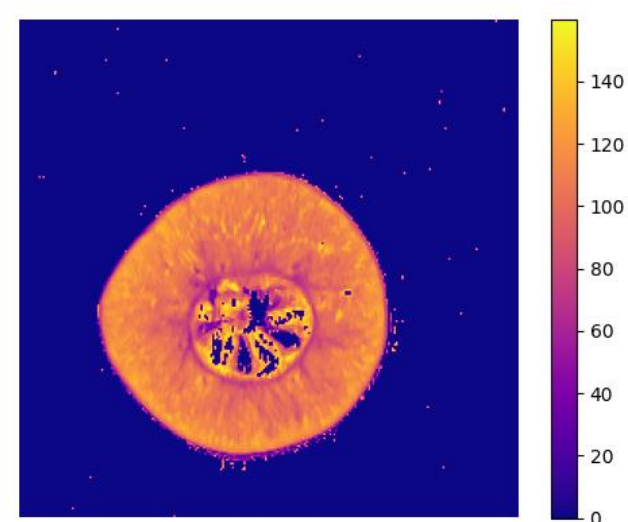
Raw



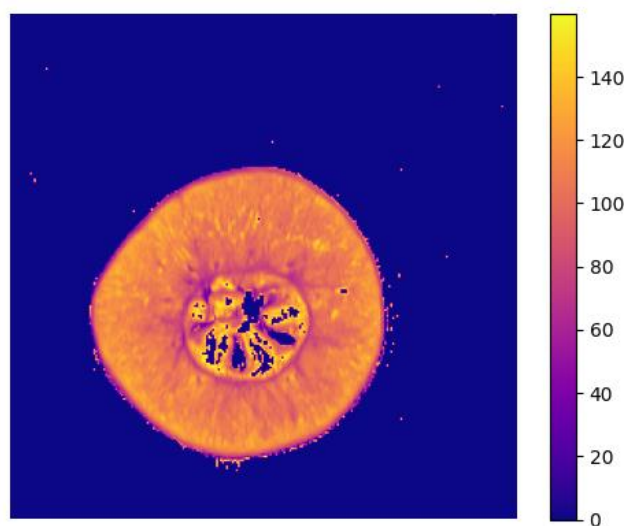
Average Blur



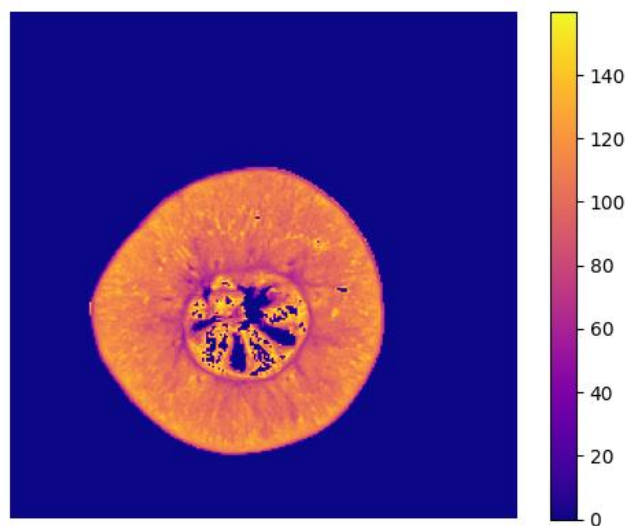
Median Blur



Gaussian Blur



Mean Threshold



Std Threshold

