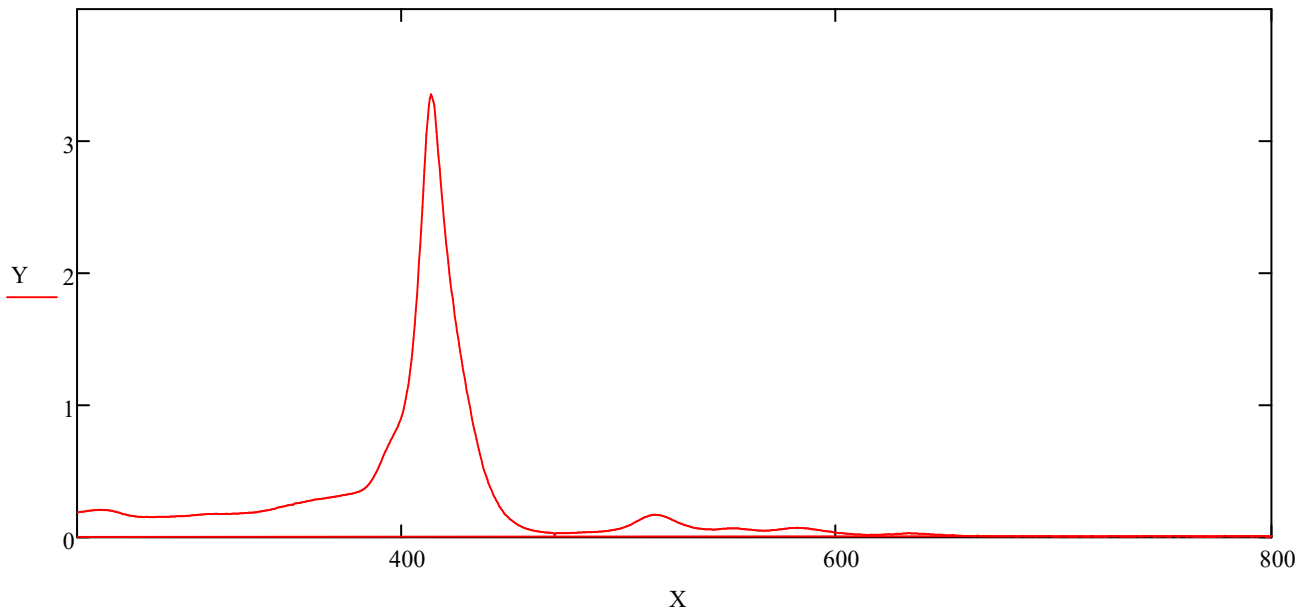


W :=

C-star calculations 2003 version.xls

X := W⁽⁸⁾

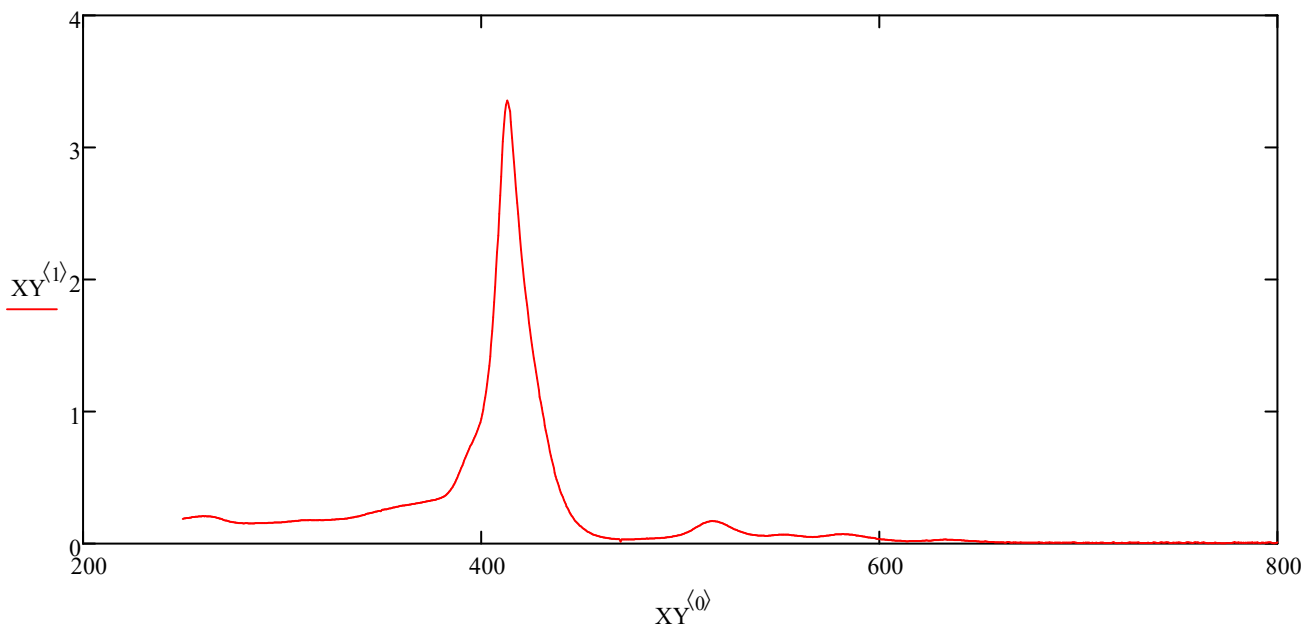
Y := W⁽¹³⁾



XY := augment(X, Y)

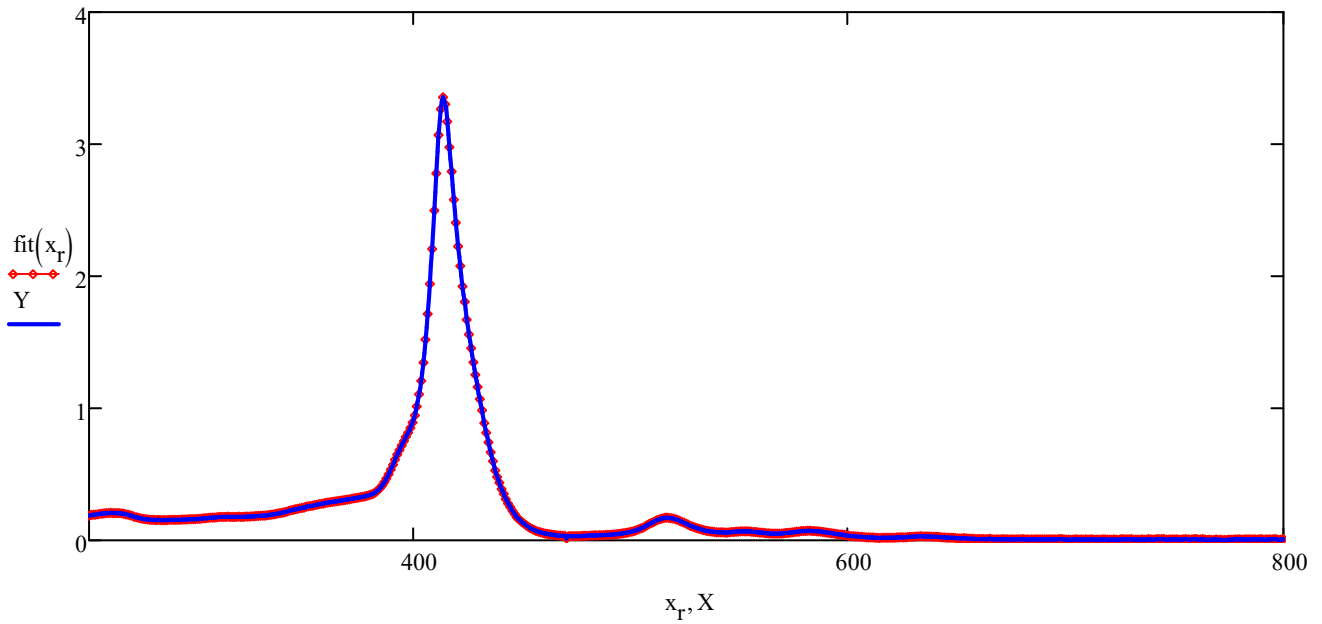
XY := csort(XY, 0)

XY := submatrix(XY, match(250, XY⁽⁰⁾)₀, rows(XY) - 1, 0, 1)



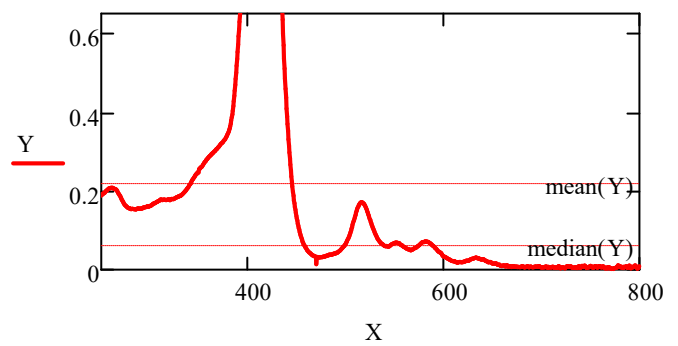
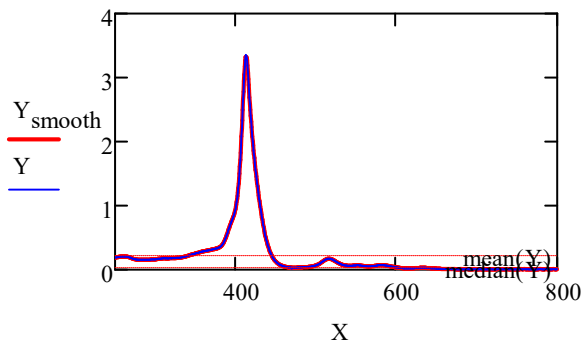
$X := XY^{(0)}$ $Y := XY^{(1)}$ $S := \text{cspline}(XY^{(0)}, XY^{(1)})$ $\text{fit}(x) := \text{interp}(S, XY^{(0)}, XY^{(1)}, x)$

$x_r := 250, 251 \dots 800$



$$\int_{250}^{800} \text{fit}(x) dx = 122.909$$

$Y_{\text{smooth}} := \text{medsmooth}(Y, 5)$ will not be used in this sheet



```

find_base(X, Y) :=
  Xb ← 0
  Yb ← 0
  tresh ← mean(Y)
  for i ∈ 0..last(X)
    if Yi < tresh
      Xbrows(Xb) ← Xi
      Ybrows(Yb) ← Yi
  line(Xb, Yb)

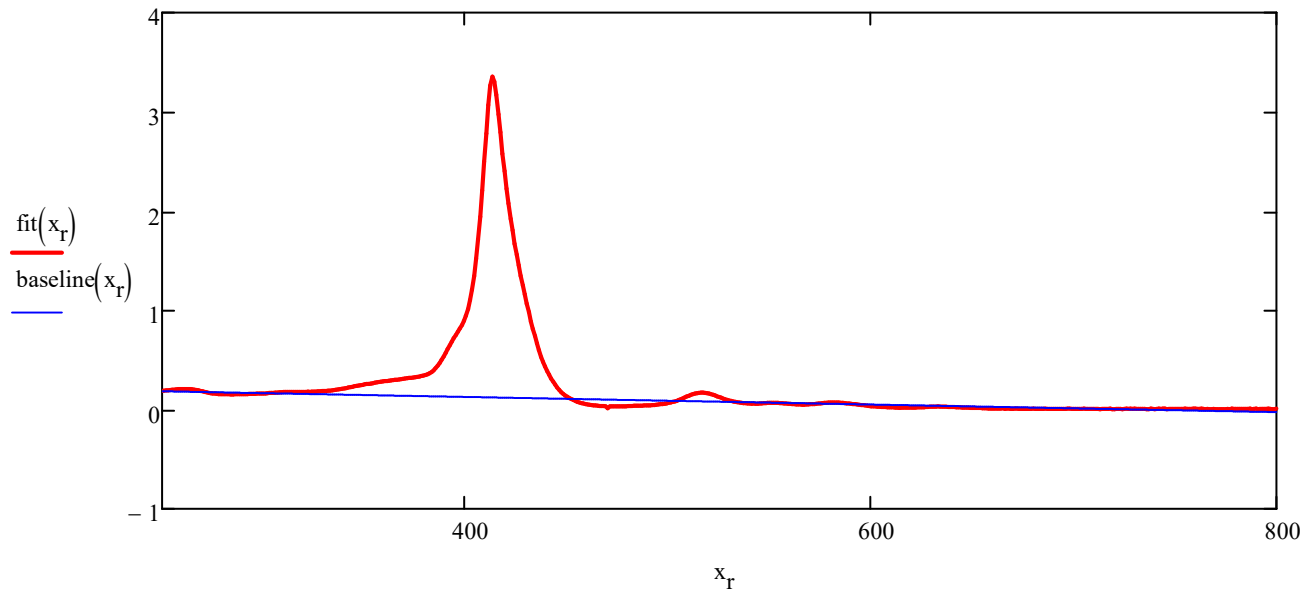
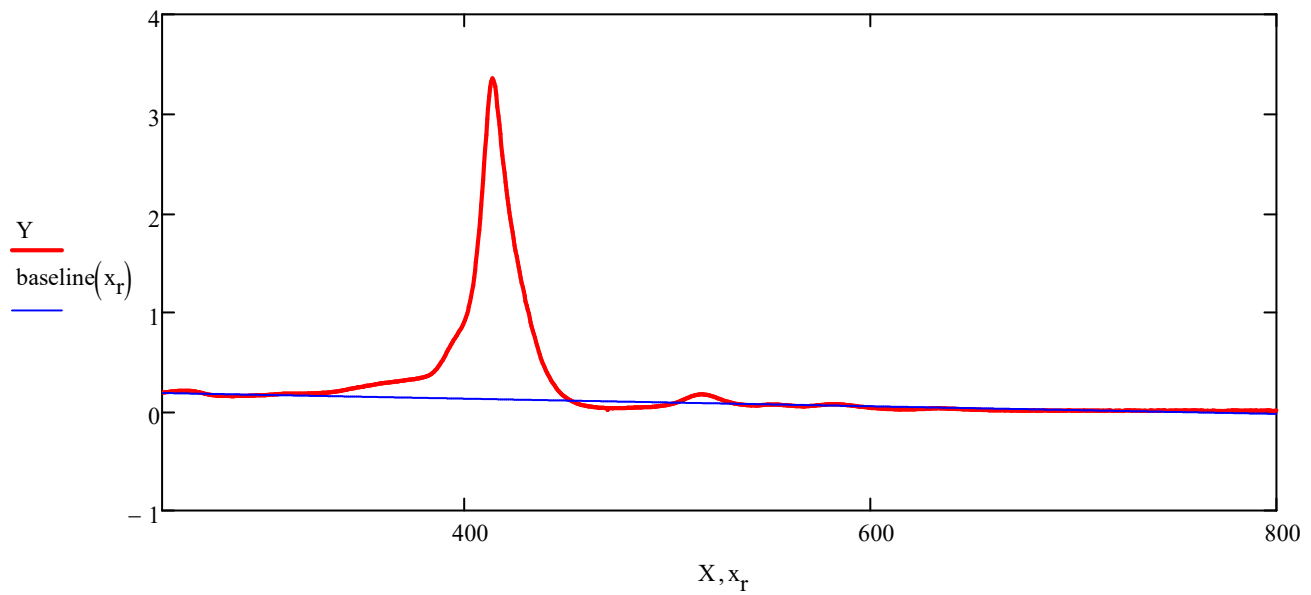
```

All point with Y-values greater than the arithmetic mean of all Y-values will be ignored when calculating the best lienaar fit.

You may try to use "median" instead of "mean" - that way ignoring exactly half of the data.

$$\text{coeff} := \text{find_base}(X, Y) = \begin{pmatrix} 0.28 \\ -3.822 \times 10^{-4} \end{pmatrix}$$

$$\text{baseline}(x) := (1 \ x) \cdot \text{coeff} \qquad \text{baseline}(x) \rightarrow -3.82228 \times 10^{-4} \cdot x + 0.2798$$



$$\int_{250}^{800} (\text{fit}(x) - \text{baseline}(x)) dx = 79.388$$

The same with an exponential fit

```

find_base(X, Y) :=
  Xb ← 0
  Yb ← 0
  tresh ← mean(Y)
  for i ∈ 0..last(X)
    if Yi < tresh
      Xbrows(Xb) ← Xi
      Ybrows(Yb) ← Yi
  expfit(Xb, Yb)

```

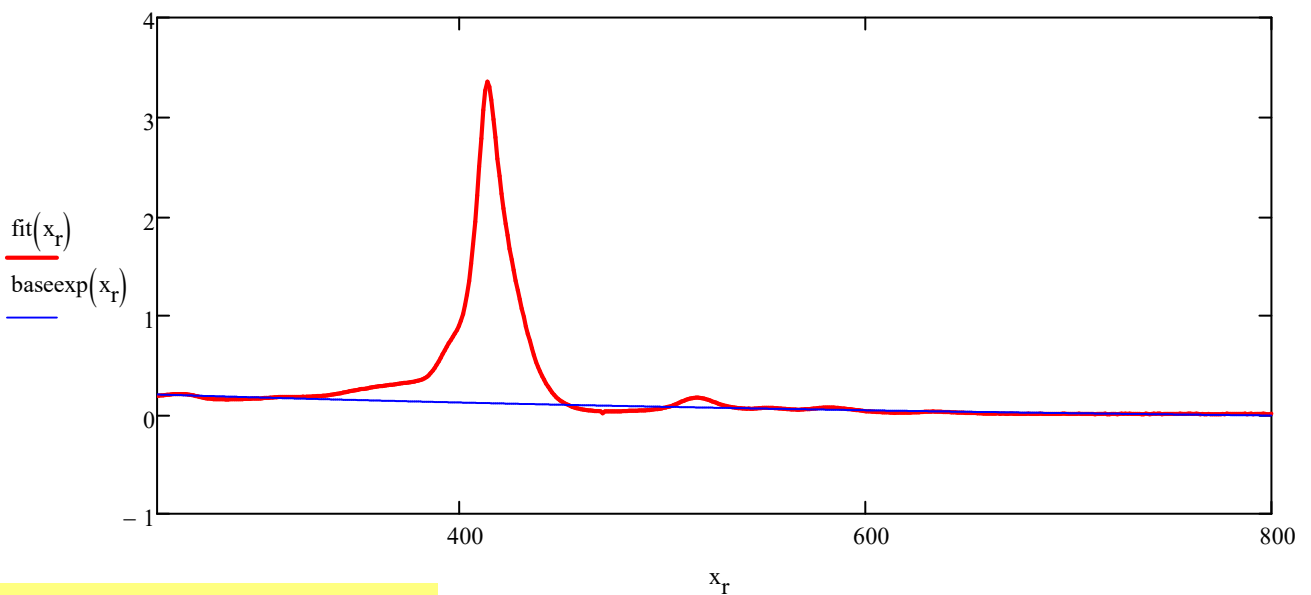
All point with Y-values greater than the arithmetic mean of all Y-values will be ignored when calculating the best linear fit.

You may try to use "median" instead of "mean" - that way ignoring exactly half of the data.

$$\text{co} := \text{find_base}(X, Y) = \begin{pmatrix} 0.525 \\ -1.933 \times 10^{-3} \\ -0.121 \end{pmatrix}$$

$$\text{baseexp}(x) := \text{co}_0 \cdot e^{\text{co}_1 \cdot x} + \text{co}_2$$

$$\text{baseexp}(x) \rightarrow 0.52519 \cdot e^{-0.00193 \cdot x} - 0.12125$$



$$\int_{250}^{800} (\text{fit}(x) - \text{baseexp}(x)) dx = 79.825$$

Just for demonstration

```
(Xb Yb) := | Xb ← 0  
           | Yb ← 0  
           | tresh ← mean(Y)  
           | for i ∈ 0..last(X)  
           |   if Yi < tresh  
           |     | Xbrows(Xb) ← Xi  
           |     | Ybrows(Yb) ← Yi  
           | (Xb Yb)
```

