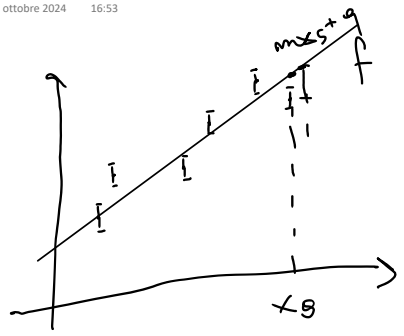
Fit

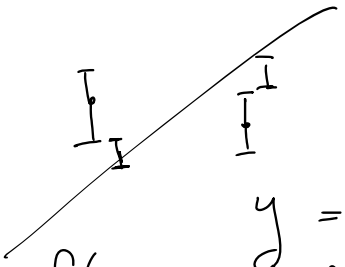
venerdì 25 ottobre 2024 16:53



$$\chi^2 = \sum_i^N \left(\frac{y_i - f(x_i; \theta_1, \dots, \theta_m)}{\sigma y_i} \right)^2$$

$(x_i ; y_i)$

$f(x_i; \theta_1, \dots, \theta_m)$



$$\rho = \frac{m}{V} \Rightarrow m = \rho V$$

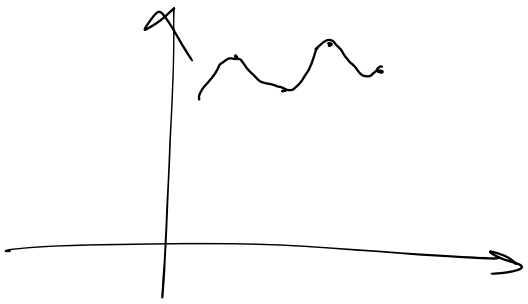
$$y = a_0 + a_1 x + a_2 x^2 + \dots$$

$$f(a_0, a_1, a_2) + f(a_0', a_1', a_2') = f(a_0 + a_0', a_1 + a_1', \dots)$$

minimizzare χ^2

$$\begin{cases} \frac{\partial \chi^2}{\partial m} = 0 \Rightarrow \frac{\partial}{\partial m} \sum_i^N \left(\frac{y_i - m x_i - q}{\sigma y_i} \right)^2 = 0 \Rightarrow \sum_i^N 2 \left(\frac{y_i - m x_i - q}{\sigma y_i} \right) \left(-\frac{x_i}{\sigma y_i} \right) = 0 \\ \frac{\partial \chi^2}{\partial q} = 0 \Rightarrow \frac{\partial}{\partial q} \sum_i^N \left(\frac{y_i - m x_i - q}{\sigma y_i} \right)^2 = 0 \Rightarrow \sum_i^N 2 \left(\frac{y_i - m x_i - q}{\sigma y_i} \right) \left(-\frac{1}{\sigma y_i} \right) = 0 \end{cases}$$

$$y = A \cos(\omega t + \varphi)$$



$$y = a_0 + a_1 t^2$$

$$popt = [\hat{a_0}, \hat{a_1}]$$

$$pcov = \begin{pmatrix} \sigma_{a_0}^2 & cov(a_0, a_1) \\ cov(a_1, a_0) & \sigma_{a_1}^2 \end{pmatrix}$$

$$A \cos(\omega t + \phi) e^{-\frac{1 \cdot t}{\tau}} + c = b$$

$$\text{no } A \cos(\omega t + \phi) e^{-bt} + c$$

$$m\ddot{D} = A\cos(\omega t + \phi)e^{-bt} + C$$

$$A \approx 300$$

$$-b \cdot 3 = -1$$

$$b = \frac{1}{3}$$

$0.303 \qquad 1.310$

. .

$$\omega \Delta t = 2\pi \rightarrow \omega = \frac{2\pi}{1.310 - 0.303}$$