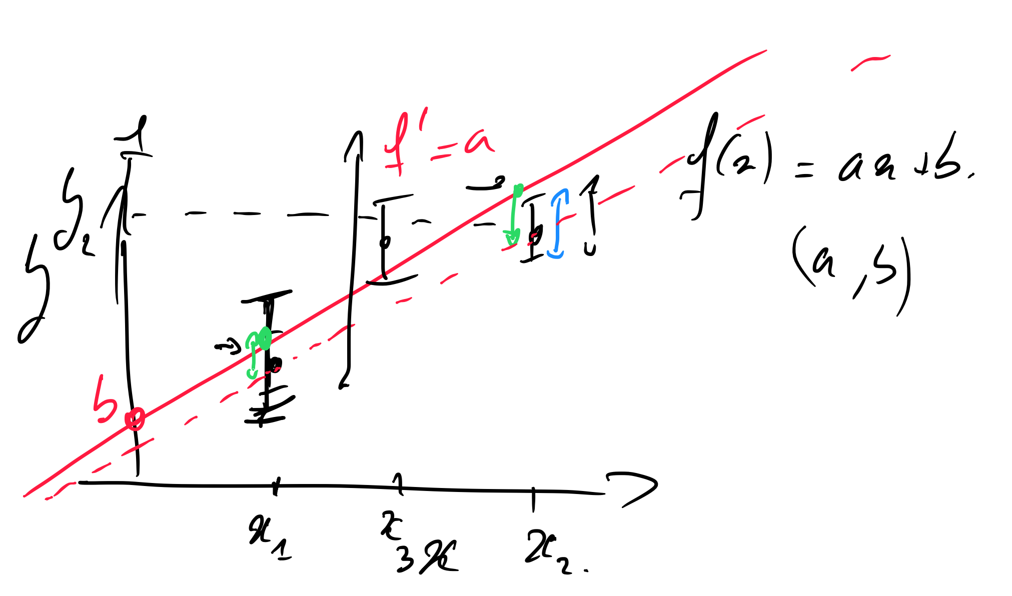
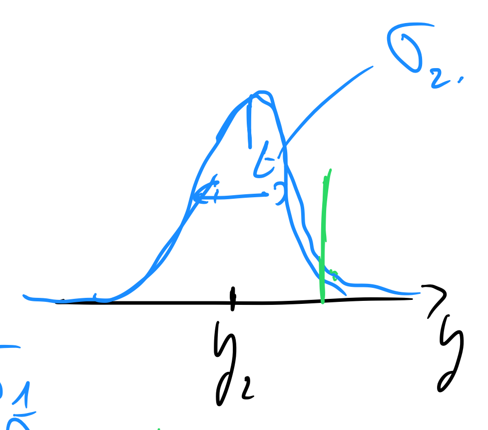
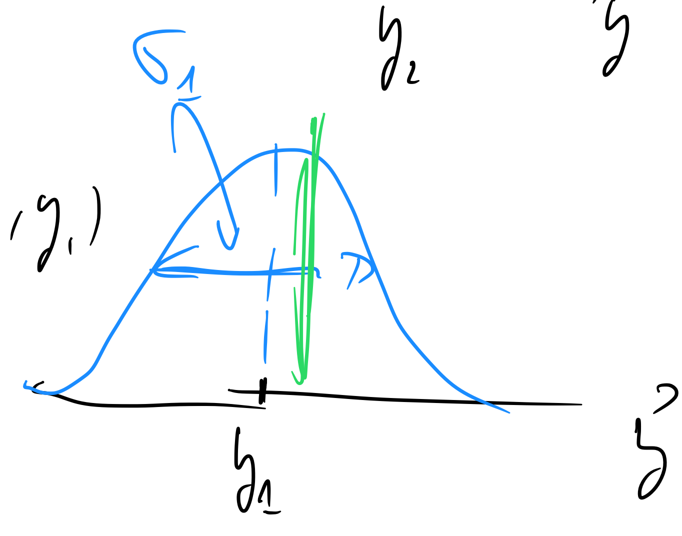
$\chi^2_{best} = 0 \longleftarrow \begin{cases} 2 \text{ pts data.} \\ 2 \text{ parámetros libre.} \end{cases}$



(x_2, y_2)



(x_1, y_1)



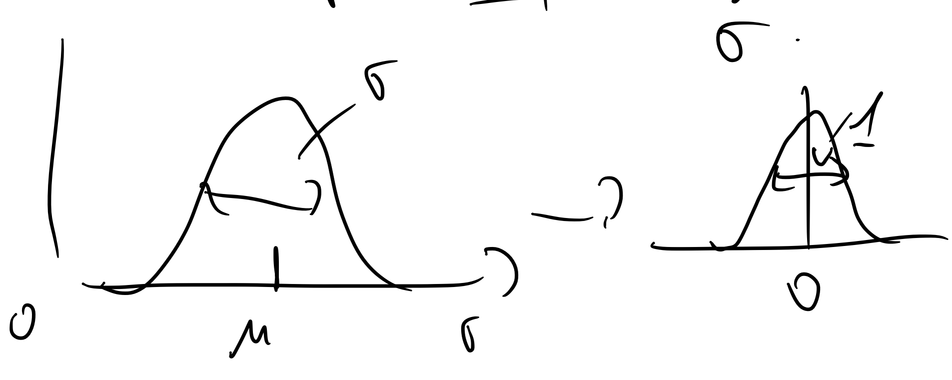
Distancia total entre modelado y Datos.

$$\sum_{i=1}^{2} \left(f(x_i) - y_i \right)^2$$

$$p\left(\left(f(x_i) - y_i\right)^2 \right) | \mathcal{N}(y_i, \sigma_i^2)$$

$$\mathcal{N}(\mu, \sigma^2) \rightarrow \mathcal{N}(0, 1)$$

$$r \rightarrow \frac{r - \mu}{\sigma}$$



$$\frac{\left(f(x_i) - y_i\right)^2}{\sigma^2} = \left(\frac{f(x_i) - y_i}{\sigma} \right)^2$$

$$\chi^2 = \sum_{i=1}^{2} \frac{\left(f(x_i) - y_i\right)^2}{\sigma_i^2}$$

Nota: demonstración ley de proba que sigue χ^2 con un numero de grado de Libertad.

$\boxed{N_{dof} = N_{data} - N_{param}}$ χ^2.

$$\chi^2(\vec{\theta}) = \sum_{i=1}^{2} \frac{\left(f(x_i | \vec{\theta}) - y_i\right)^2}{\sigma_i^2}$$

$\vec{\theta} = (a, b)$

$\vec{\theta} = (a, b)$

Metodología.

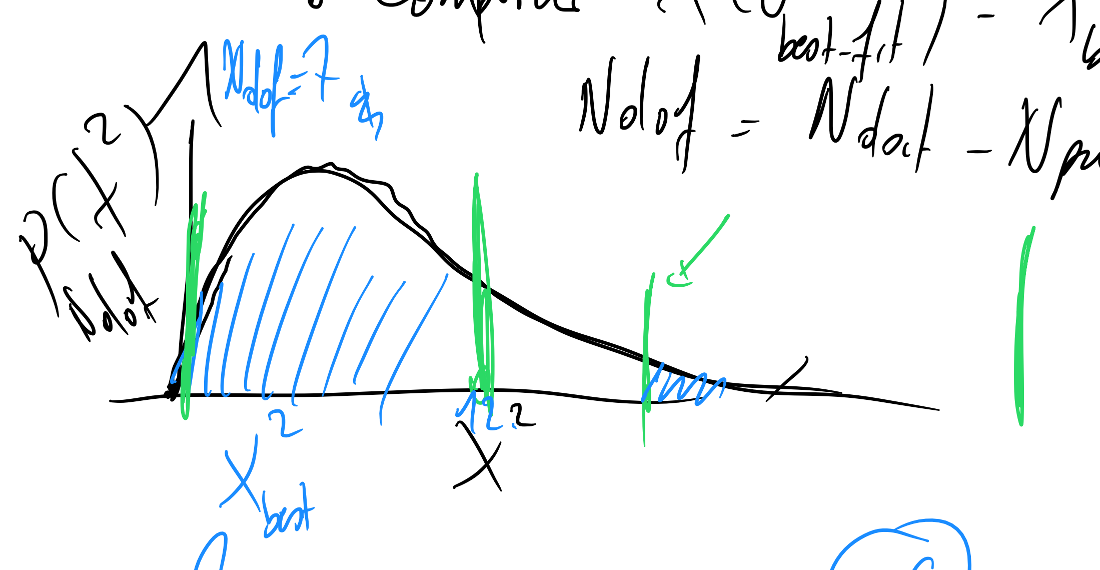
- Datos (N_{datos}) y_i σ_i
- Modelado $\vec{\theta}$ N_{par}
- $\chi^2(\vec{\theta}) \rightarrow \boxed{\vec{\theta}_{best-fit}}$

$$\rightarrow \chi^2(z) = \sum_{colores} \frac{\left(color^{th}(z) - color^{med}\right)^2}{\sigma_{col}^2}$$

$$\rightarrow \chi^2(z, z_f) = \sum_{colors} \frac{\left(color^{th}(z, z_f) - color^{med}\right)^2}{\sigma_{col}^2}$$

- Comparar $\chi^2(\vec{\theta}_{best-fit}) = \chi^2_{best-fit}$.

$N_{dof} = N_{dat} - N_{par}$

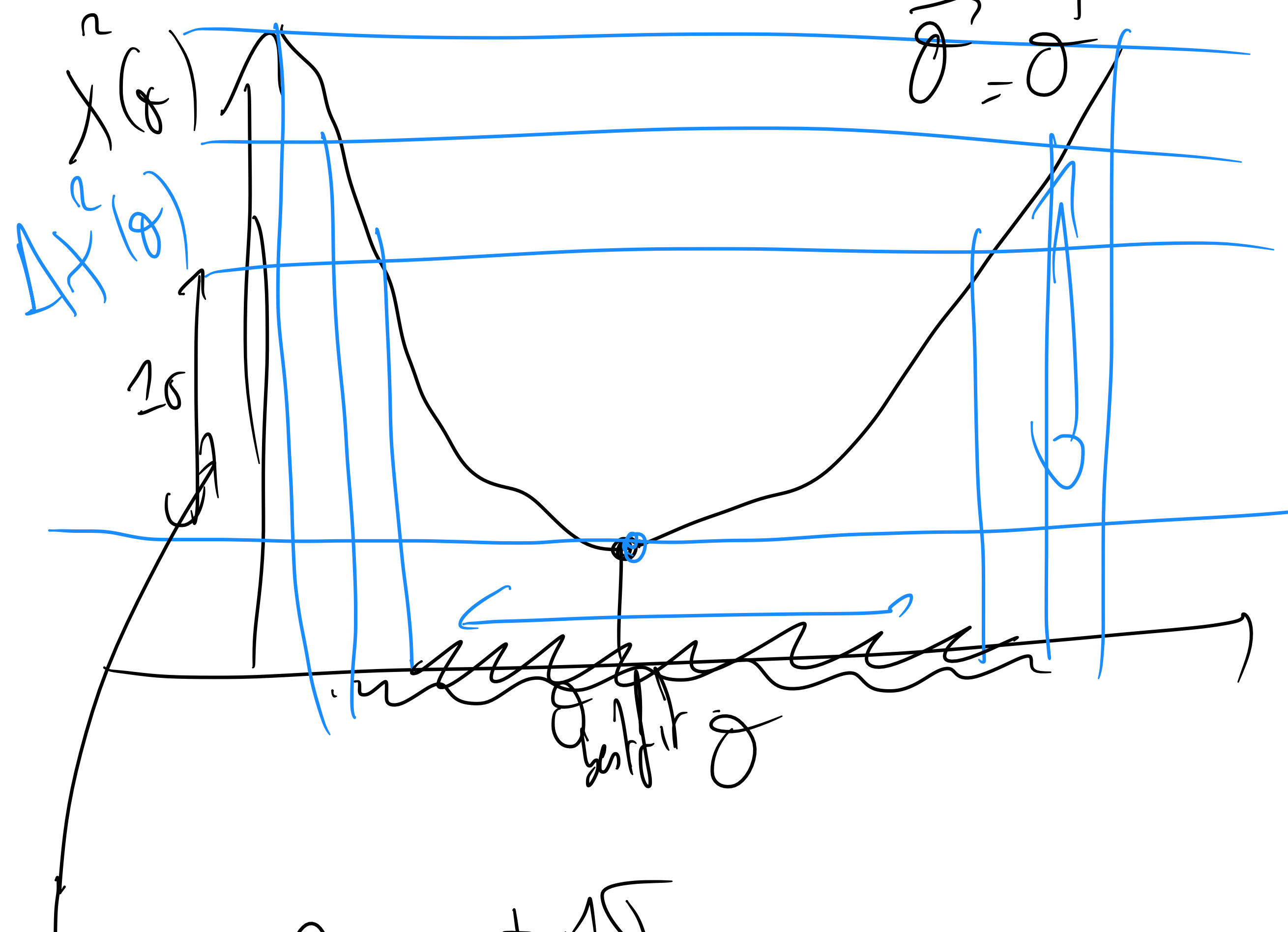


$$\int_0 p(\chi^2) \, d\chi^2 < 0.5 \quad 0.95$$

$\boxed{\text{Si } \chi^2_{bestfit} \text{ es aceptable. (pvalue)}}$

Ya olvidamos el valor de $\chi^2_{bestfit} = \chi^2(\vec{\theta}_{bestfit})$

$$\Delta\chi^2(\vec{\theta}) = \chi^2(\vec{\theta}) - \chi^2(\vec{\theta}_{bestfit})$$



$\theta_{bestfit} \pm 1\sigma$

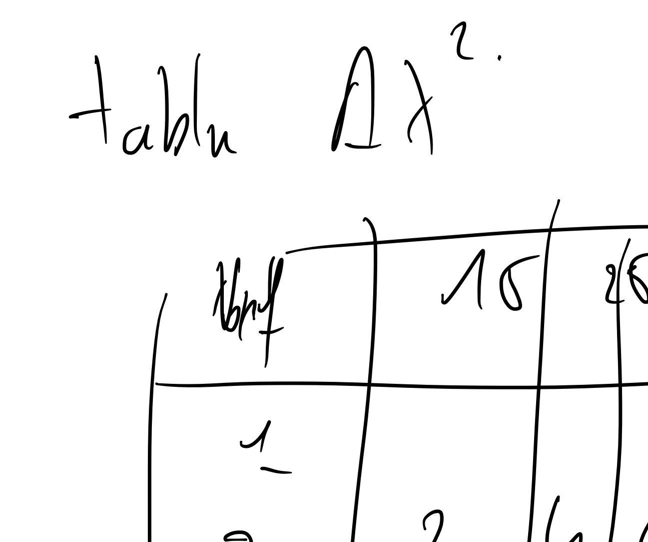
Con la definición de la ley de χ^2

con $\boxed{N_{dof} = N_{par}.}$

Likelihood.	$\longrightarrow$	Posterior
χ^2.		$\Delta\chi^2$.
Data $\vert \theta$		$\vec{\theta} \vert$ Data

$N_{dof} = 1$

$$p(\chi^2, N_{dof} = 1)$$



$$\int_0^? d\chi^2 \, p(\chi^2, N_{dof} = 1) = \begin{matrix} 68.3\% & 1\sigma \\ 95.5\% & 2\sigma \\ 99.98\% & 3\sigma \end{matrix}$$

tabla $\Delta\chi^2$.

N_{dof}	1σ	2σ	3σ
1			
2	2	4	6
3	.	.	.