Herramientas Computacionales para Ciencias
Homework 10b

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[1.0/5.0] Fitting a Gaussian!

On this part of the assignment, we will face a typical scientific fit problem. An *easy* problem that does not work.

We will use real data of a emission spectrum of a ^{137}Cs source, measured with a scintillator of NaI at the Nuclear Physics group at the Universidad Nacional de Colombia, for the course *Nuclear Instrumentation* 2017-I. Available on the link,

`raw.githubusercontent.com/jmsevillam/Herramientas-Computacionales-UniAndes/master/Data/Spectra/137Cs_10min.dat`

- Get the data (Use `genfromtxt`) and plot it.
- Restrict yourself to an interval where the most appreciable part is the Gaussian centered more or less on 300.
- Define a Gaussian function and sum a straight line (background).

$$G(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{(x-\mu)}{\sigma}\right)} + m \cdot x + b \tag{1}$$

  Hint: Use the amplitude as a third parameter of the Gaussian.
- Use the function `curve_fit` to fit the Gaussian.
- Estimate (visually) the parameters μ, σ and the amplitude. Use 1 for m and b.
- Add as a new option to the function `curve_fit`, `p0=[sigma_test,mu_test,Amp_test,1,1]` where `sigma_test`, `mu_test` and `Amp_test` are your estimations.
- Plot and the Gaussian and its fit.
- Comment your results.

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