**HW4:**

This time, I would like you to fit the number 29 scan in the lc4O8\_d0025\_a data (which we fit in the class for many times) with an incline ( a slope ) background. So you need to modify the fitgauss.m and define a slope background.

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HOMEWORK 4

clc;

clear all;

[verim]=specokuma('lc4O8\_d0025\_a',29);

q=verim(:,1);A=verim(:,end);dA=sqrt(verim(:,end));

figure; hold on;

n=[3150 0.223 0.03 10 100]; % I added another element n(4) as slope background

mask=[1 1 1 1 1]; %to match the size of the matrix mask should be a row matrix of 5 ones

[nfit1,R1,J1,covB1]=nlinfit(q,A,'gaussfit',n,'Weights',dA);

lfit=gaussfit(nfit1,q);

l1=plot(q,lfit,'b-');

errorbar(q,A,dA,'ok');

GAUSSFIT

function [Afit] = gaussfit(n, X)

% n = [Amplitude, Centre, Width, Slope, ConstantBackground];

Amp = abs(n(1));

Xc = n(2);

width = abs(n(3));

slope = n(4);

backgnd = n(5);

gaussianCalc = Amp \* exp(-0.5 \* ((X - Xc) / width).^2);

slope\_backgrnd = slope \* X;

%A "slope background" refers to a linear or inclined background in a dataset.

%It represents a systematic increase or decrease in the values of

% the dependent variable with respect to the independent variable.

constant\_backgrnd = backgnd;

% Combined fit

Afit = gaussianCalc + slope\_backgrnd + constant\_backgrnd;

%The impact of the inclined background depends on the magnitude of the slope parameter.

% In our case the slope is very small compared to the amplitude of the Gaussian peak

% or the constant background, its contribution may not be visually prominent.

end

