

Physics 493L: Homework #1
Due February 8, 2013
10 points

The MATLAB file 'HW1_data.mat' contains the variables 'x', 'y_norm', and 'y_pois'. The variables 'y_norm' and 'y_pois' represent measured values at positions 'x'. The measurement process for 'y_norm' yielded measurements that are distributed normally (with a Gaussian distribution) about the true value. The measurement process for 'y_pois' yielded measurements that are Poisson distributed. The underlying model for both data sets is given by $y = A \sin^2(\omega x)$.

For each case, use `fminsearch` to make a maximum likelihood estimate for A and ω . Your solution should consist of a set of MATLAB *.m files. Depending on how you implement your solution, you may need between 1 and 3 *.m files. When your files are present in the same directory as 'HW1_data.mat', your solution must run, unaltered, and produce at least the following:

For each case, the estimated value for A and ω should be written to the command line as a human readable result using `fprintf`.

For each case, the model generated from your estimated values should be plotted on top of the noisy data. Your plot must have axis labels and a legend.

For organizational purposes, please name your *.m files as 'LastName_HW1_Descriptor', e.g. 'Lidke_HW1_Main.m', 'Lidke_HW1_Func1.m', etc. Submit your results by e-mail to klidke@unm.edu with the subject line '493L HW1.'