

FITTING A LINE TO DATA

Due Date: 4/23/2014 @ 11:59 pm

- Find the best fitting parameters and their uncertainties for a line model (Tully-Fisher relation) fitted to data using Generalized Least Squares (GLS) method.
- Repeat the previous part but use a non-linear minimizer (Levenberg-Marquardt method).
- Implement the Metropolis-Hastings MCMC sampler and use it once again to find the best fitting parameters and their uncertainties of the line model. Analyze how different proposal distributions affect the sampling. Plot parameter chains that you generate by using different proposal distributions and starting from different initial locations. Make a diagram of the 2-dimensional and 1-dimensional marginalized posterior distributions for both parameters. After you have sampled the posterior distribution, draw 100 random values, generate models and plot them over the data points.
- Discuss how all three methods compare.