

PHYS 240 homework #13 – due Mar 12 2013, 5:25pm, upload to Canvas

Power-law fits to online data

1. Using our code from class, `lsfdemo.py`, as a starting point, download an interesting data set online, and fit it with either a power-law or an exponential function (by transforming this back and forth to a linear function). Report the results you get on parameter fits, uncertainties, and χ^2 value. Comment on whether or not a linear, power-law, and/or exponential is a good representation of the data.

Some possible sources of data are listed below. If uncertainties σ_i are not provided on the measurements (*yes, scientists still neglect to do this!*), then adopt a uniform $\sigma_i = \sigma_0$ using a plausible value. Also, if you find an interesting data set in a plot but do not have the tabular data available, you can use this handy tool to grab the data: <http://arohatgi.info/WebPlotDigitizer/>

- supermassive black hole mass vs. galaxy bulge mass:
<http://adsabs.harvard.edu/abs/2004ApJ...604L..89H>
- global temperature vs. time:
http://data.giss.nasa.gov/gistemp/graphs_v3/
- orbital inclination vs. period of extrasolar planets (if you click on the \pm symbols on the table columns, you can bring up the uncertainties):
<http://exoplanets.org/table>

2. Include any discussion in a report generated in L^AT_EX. Also submit your Python code separately.