

Intermediate Lab

PHYS 3870

CONVEYING INFORMATION

Gathering Information

An Exercise in DataThief, Plotting and Curve Fitting

References:

PHYS 3870 [Web Site](#)

USU [Library Class Web Site](#)

[DataThief Manual](#)

[DataThief Web Site](#)



Introduction to Scientific Computing

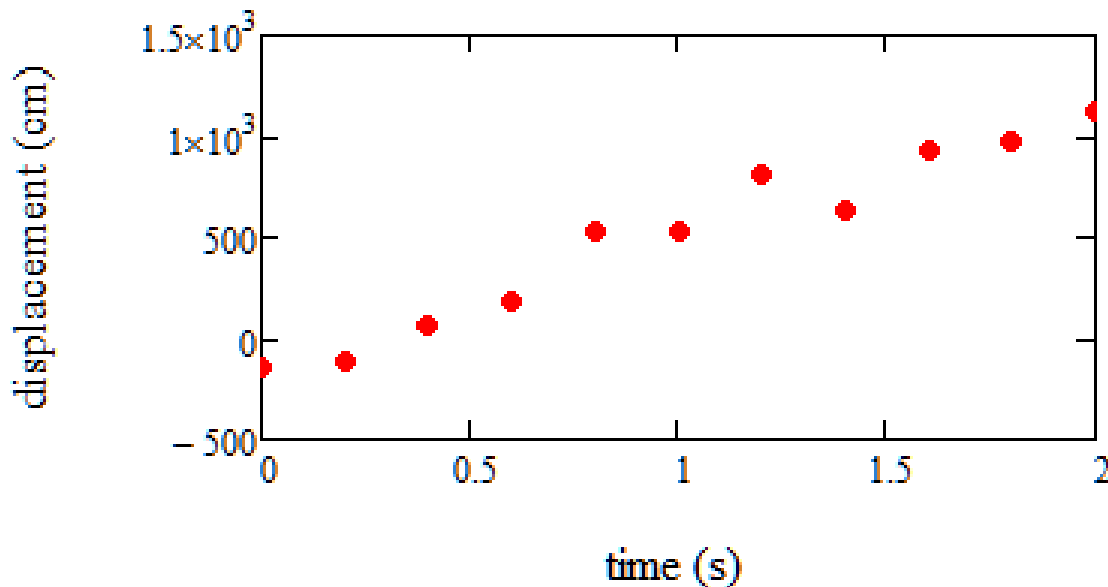
PHYS 38700

An Exercise In Data Analysis

- Use *DataThief* to “steal” data from the graph in *DennisonInFreefall.jpg* and save the data in the file *YOURNAMEInFreefall.txt*:
- In your favorite plotting and curve fitting program:
 - Import the data from *DennisonInFreefall.jpg* stored in *YOURNAMEInFreefall.txt*
 - Import the data from *FreefallLab.txt*
 - Create a single graph of position vs time with:
 - Data points and error bars from *FreefallLab.txt*
 - Data points (the slacker has no error estimates here!) from *DennisonInFreefall.jpg*
 - A mathematical model for free fall plotted as a line
 - List your best estimates for values and errors for you model fitting parameters
 - BONUS:
 - Linearize your model, that is plot the dependant variable versus some function (e.g., square, square root) of the dependant variable such that the plot yields a straight line
 - Plot both data sets (with appropriate errors) and your linear model on a linearized graph
 - Do an automated fit with your linear model to the *FreefallLab* data. List your best estimates of the slope and intercept (with errors) and from these the best estimates (with errors) for you original model fitting parameters.

Data for An Exercise In Data Analysis

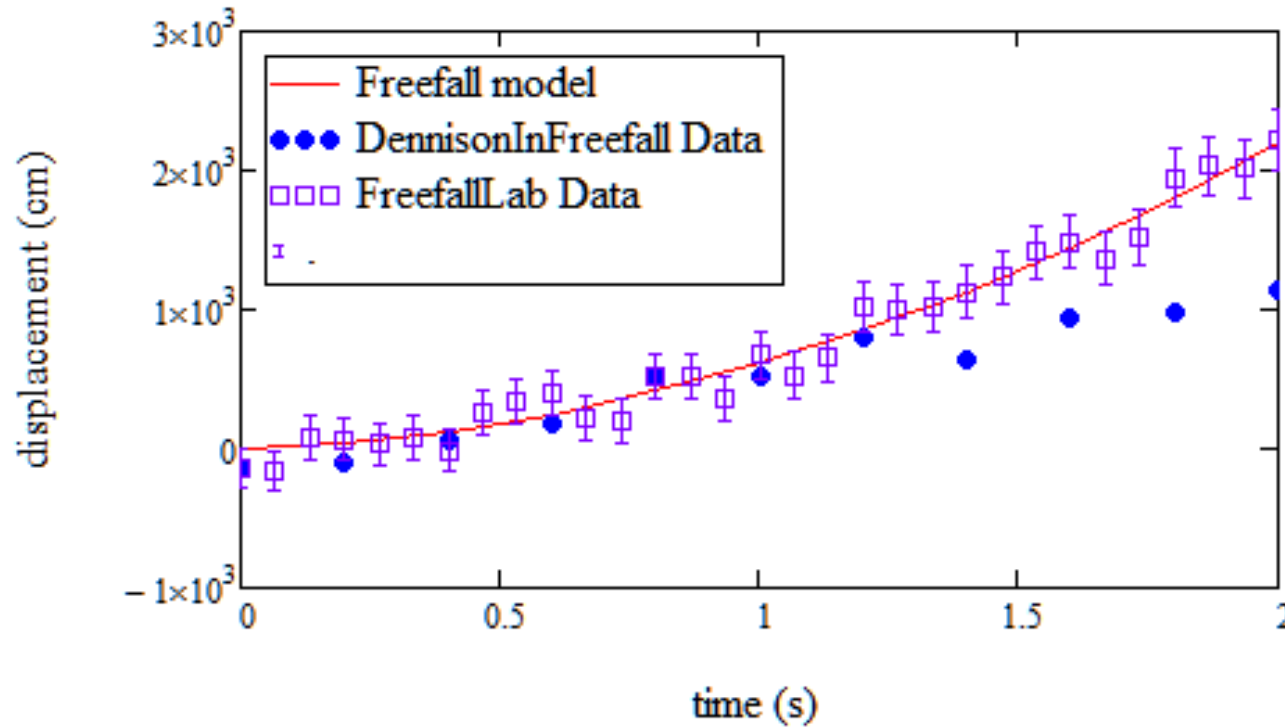
DennisonInFreefall.jpg



Freefall.txt

time(s)	disp(m)	error(m)
0	-137.5	145.9
0.06667	-157.6	145.3
0.1333	81.61	152.4
0.2	62.14	151.9
0.2667	30.93	150.9
0.3333	81.17	152.4
0.4	-12.04	149.6
0.4667	258.4	157.8
0.5333	334.6	160
0.6	398.2	161.9
0.6667	218.3	156.5
0.7333	202.9	156.1
0.8	524.1	165.7
0.8667	516.4	165.5
0.9333	368.3	161
1	672	170.2
1.067	527.9	165.8
1.133	656.7	169.7
1.2	1018	180.5
1.267	1004	180.1
1.333	1029	180.9
1.4	1128	183.8
1.467	1234	187
1.533	1412	192.4
1.6	1489	194.7
1.667	1364	190.9
1.733	1521	195.6
1.8	1949	208.5
1.867	2031	210.9
1.933	2016	210.5
2	2222	216.6

Results for An Exercise In Data Analysis



Model is $y(t) = (1/2)at^2 + v_0t + y_0$