

PHYS20762 - Computational Physics

Project 2 - Numerical Solution of a Differential Equation

Assessment Form

Objective: to evaluate the efficacy of a number of different numerical methods of solving the damped simple harmonic oscillator.

Method:

- write a MATLAB/Python program to solve an ordinary 2nd order differential equation numerically;
- compare the precision of the four different methods (incl. comparing Euler/Euler-Cromer) and evaluate it as a function of the number of steps of integration;
- plot the solutions graphically;
- store data in a file; read data from the file; plot results in useful form (phase space and energy).

Produced material:

- report, i.e. a short scientific paper (strongly recommended to use template as for lab reports) that includes:
- introduction/discussion/conclusions sections;
- program code (properly commented);
- all relevant graphs and a summary table
- Final Work: calculation and presentation of resonance curve

Student's name:

	unsatis- factory	poor	fair	good	very good	exceptional			
	≤ 3	4	5	6	7	≥ 8	mark ex 10	weight	actual mark
Presentation, organisation, English, spelling, grammar, clarity, conciseness, scientific style								20	
Code correctness and style								35	
Use of graphics								10	
Results and interpretation								10	
Initiative, originality								15	
Final work								10	
Total mark (ex 100)	---	---	---	---	---	---	---	100	

Comments:

Signed:

Date: