TFY4235/FY8904 Computational Physics, Spring 2013

Problem Set 8

Problem 1.

Solve the equation

$$\frac{d^2y}{dx^2} + \omega_0^2 y = 0 \tag{1}$$

numerically for different initial conditions and tabulate the solutions graphically in the $\{y, y'\}$ plane. Do the same with the equation

$$\frac{d^2y}{dx^2} + \omega_0^2 y + \beta y^3 = 0 \; . \tag{2}$$

Discuss the solution. Compare the behavior of the numerical solutions using explicit and implicit Euler integration.