

# ANALYSIS OF DYNAMICAL SYSTEMS

## Variant 15

### Part 1: Particle in a double well potential with linear damping

Analyse 2-D system.

$$\ddot{x} + \gamma \dot{x} - \frac{1}{2} (1 - x^2) x = 0,$$

where  $\gamma$  is the coefficient of damping and  $\gamma = 0.1$ .

### Part 2: Modified Chen attractor

Determine whether the following 3-D system represents a strange attractor or not.

$$\begin{cases} \dot{x} = a(y - x), \\ \dot{y} = (c - a)x - xz + cy + m, \\ \dot{z} = xy - bz, \end{cases}$$

where the constants have the following values:  $a = 35$ ,  $b = 3$ ,  $c = 28$ ,  $m = 23.1$ .