Analysis of Dynamical Systems

Variant 1

Part 1: Liénard type equation

Analyse 2-D system.

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

where μ is the constants and it can be shown that for $\mu > 0$ only one periodic solution exists.

Part 2: Rössler attractor[1]

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

$$\begin{cases} \dot{x} = -y - z, \\ \dot{y} = x + ay, \\ \dot{z} = b + z\,(x - c), \end{cases}$$

where a, b ja c are constants.

Parameter	version **1.1**	version **1.2**
a	0.2	0.1
b	0.2	0.1
c	5.7	14.0

[1] Some aspects of the dynamics of this system are discussed during the lectures.