Автоколебания в биологических и химических структурах

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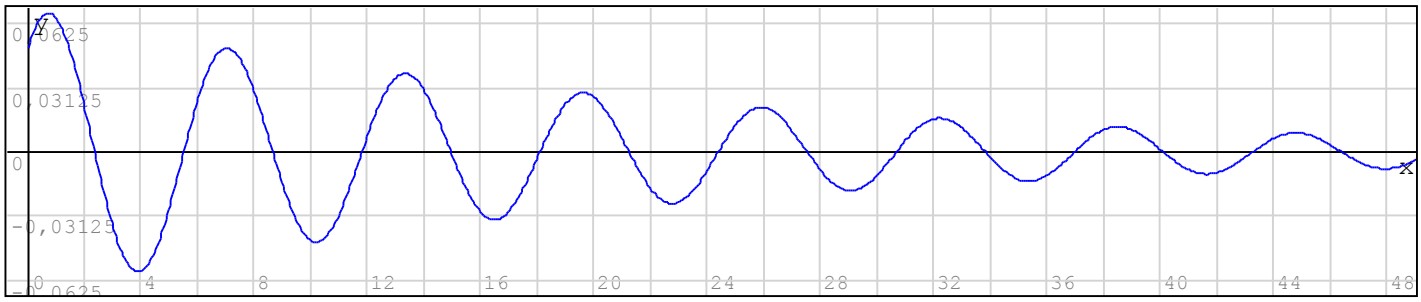
$$F(t, x, \alpha, \gamma) := \begin{pmatrix} \alpha \cdot x_1 + x_2 + 0.1 \cdot x_3 \\ -x_1 \\ \gamma \cdot \left(-4 \cdot \left(x_1 + x_1^2 + x_3\right)\right) + \tanh\left(100 \cdot \left(1 - 16 \cdot x_1 + 4 \cdot x_3\right)\right) \end{pmatrix}$$

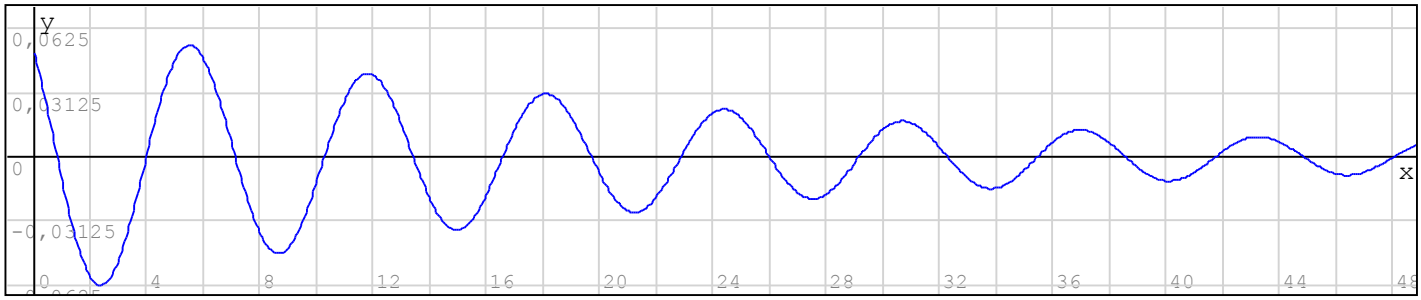
$x0 := \text{stack}(0.05, 0.05, 0.02)$ $N := 1000$

$X := \text{dn\_GearsBDF}(x0, 0, 50, N, F(t, x, \alpha := 0.01, \gamma := 100))$

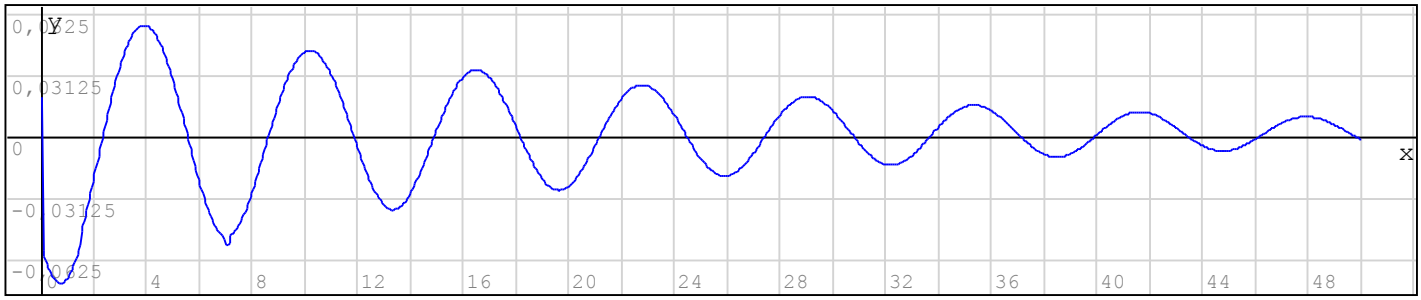
$T := \text{col}(X, 1)$ $U := \text{col}(X, 2)$ $V := \text{col}(X, 3)$ $S := \text{col}(X, 4)$



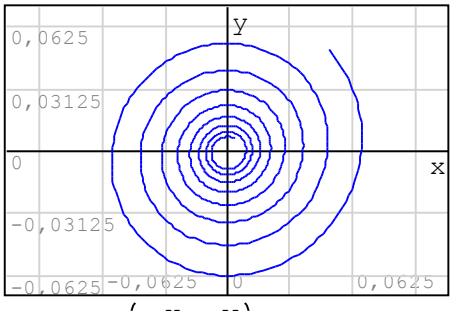
augment(T, U)



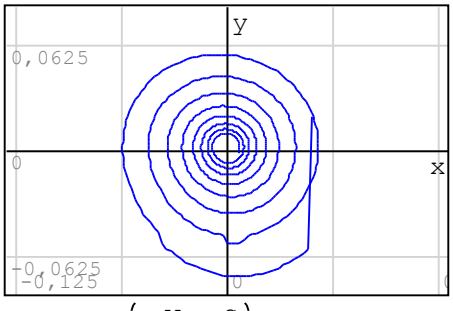
augment(T, V)



augment(T, S)



augment(U, V)



augment(V, S)