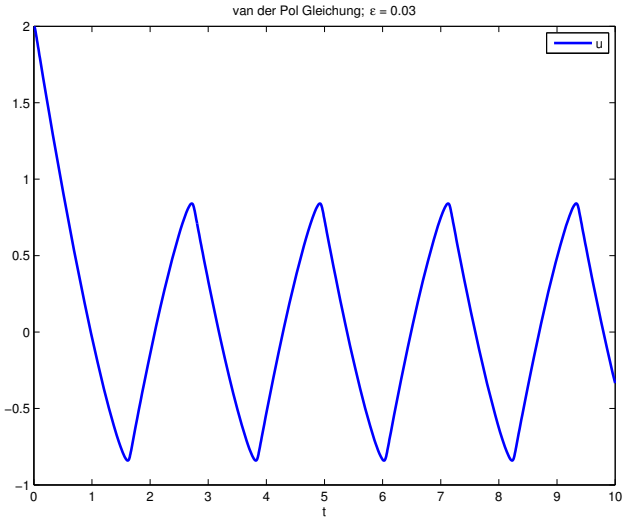
Van der Pol Equation

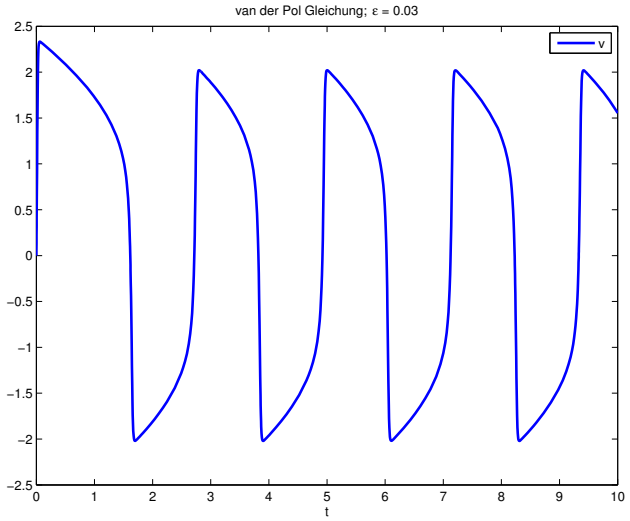
scalar

$$\varepsilon v'' + (v^2 - 1)v' + v = 0$$

as a first order system:

$$\begin{aligned} u' &= -v \\ \varepsilon v' &= u - (v^3/3 - v) \end{aligned}$$





ε	fct evals ODE15s	fct evals ODE45
0.3	1,595	2,503
0.03	5,051	10,555
0.003	7,960	39,583
0.0003	10,735	171,181

`RelTol = 1.e-8,`

`AbsTol = 1.e-10`

$\varepsilon = 0.03, \qquad u(0) = 2, \quad v(0) = 0$