LOCA Examples

0.1 Brusselator problem

BrusselatorProblemInterface implements the LOCA::LAPACK::Interface for a 1D finite-difference discretization of the Brusselator problem:

$$\frac{\partial T}{\partial t} = D_1 \frac{\partial^2 T}{\partial x^2} + \alpha - (\beta + 1)T + T^2 C$$

$$\frac{\partial C}{\partial t} = D_2 \frac{\partial^2 C}{\partial x^2} + \beta T - T^2 C$$

subject to the boundary conditions $T(0) = T(1) = \alpha$, $C(0) = C(1) = \beta/\alpha$. The parameters are α, β, D_1, D_2 and n, the size of the discretization.

0.2 The Chan problem

ChanProblemInterface implements the LOCA::LAPACK::Interface for a 1D finite-difference discretization of the Chan problem:

$$\frac{d^2 T}{dx^2} + \alpha s \left(1 + \frac{x + 0.5x^2}{1 + 0.01x^2} \right) = 0$$

subject to the boundary conditions $T(0) = T(1) = \beta$. The parameters are α, β, s, and n, the size of the discretization. The scaling factor s is used to test continuation at different scales of α