

1D Steady-State Problems (Galerkin method)

PDEs:

$$\begin{aligned}\frac{\partial A_1}{\partial x}(x, U_1, U_{1_x}, \dots, U_N, U_{N_x}) &= F_1(x, U_1, U_{1_x}, \dots, U_N, U_{N_x}) \\ &= \\ &= \\ \frac{\partial A_N}{\partial x}(x, U_1, U_{1_x}, \dots, U_N, U_{N_x}) &= F_N(x, U_1, U_{1_x}, \dots, U_N, U_{N_x})\end{aligned}$$

Boundary conditions (at endpoints):

$$\begin{aligned}U_1 &= FB_1 \\ &= \\ &= \\ U_N &= FB_N\end{aligned}$$

or

$$\begin{aligned}\pm A_1 &= GB_1(U_1, U_{1_x}, \dots, U_N, U_{N_x}) \\ &= \\ &= \\ \pm A_N &= GB_N(U_1, U_{1_x}, \dots, U_N, U_{N_x})\end{aligned}$$