Solution of 2-D Euler Equations: Solid Rocket Motor

Spatial discretisation schemes:

- Central scheme with scalar artificial dissipation:
  \[ \sigma = 7.5, \quad \epsilon = 0.8, \quad k^{(2)} = 0.5, \quad k^{(4)} = 1/48 \]

- Roe’s upwind scheme:
  \[ \sigma = 4.5, \quad \epsilon = 0.8, \quad K = 20 \]

Boundary conditions:
\[ \dot{m}_{inj} = 13.0 \text{ kg/m}^2\text{s}, \quad T_{inj} = 260.0 \text{ K}. \]

Reference:
Mach number distribution computed by Roe’s scheme (scaled by factor 10 in the vertical direction).

Mach number distribution and velocity vectors at the head end computed by Roe’s scheme (scaled by factor 10 in the vertical direction).
Normalised static pressure \( (p/p_H) \) over the axial distance.

Axial velocity at the centerline over the axial distance.