



$$\Gamma_{\text{wall}} \cup \Gamma_{\text{axis}} \cup \Gamma_{\text{obstacle}} : \mathbf{u} \cdot \mathbf{n} = 0 \text{ and } \boldsymbol{\sigma}_{nt} = 0$$

$$\Gamma_{\text{upstream}} \cup \Gamma_{\text{downstream}} : \mathbf{u} = (1, 0)$$