

## 0.1 Stationary FSI problem

In this example we consider a simple stationary FSI problem. The fluid is given as an incompressible Newtonian fluid modelled by the Stokes equation. Here, we use the symmetric stress tensor which has a little consequence when using the do-nothing outflow condition. In strong formulation we have

$$\begin{aligned} -\nabla \cdot (\nabla v + \nabla v^T) + (v \cdot \nabla)v + \nabla p &= f \\ \operatorname{div} v &= 0 \end{aligned}$$

on the domain  $\Omega = [-6, 6] \times [0, 2]$ . We choose for simplicity  $f = 0$ . On the other hand, the structure is given by incompressible neo-Hookean model (INH). The constitutive equation for the Cauchy stress tensor is given as  $\sigma = pI + \mu_s(FF^T - I)$ , where  $F := I + \nabla u$ .