1 Monodomain model: without level set

Mechanics Step II : Fluid-oriented Resolution

$$\nabla \cdot \mathbf{v}_{\text{II}} = 0$$

Conservation of energy (Nonlinear Heat Transfer)

$$\frac{\partial \langle \rho h \rangle}{\partial t} + \nabla \cdot \langle \rho h \vec{v} \rangle + \nabla \cdot \left(\langle \kappa \rangle \vec{\nabla} T \right) = 0$$

Conservation of chemical species (Macrosegregation)

$$\frac{\partial \langle w_i \rangle}{\partial t} + \langle \mathbf{v}_{\text{II}} \rangle \cdot \nabla \langle w_i \rangle^l = \nabla \cdot \left(\langle D^l \rangle \nabla \langle w_i \rangle^l \right)$$

Microsegregation

$$\left(g^\phi, \langle w_i^\phi \rangle^\phi \right) = f \left(\langle w_i \rangle, T \right)$$
$$\frac{\partial \langle \rho h \rangle}{\partial T} = \frac{\partial}{\partial T} \left(\sum_\phi g^\phi \langle \rho h \rangle^\phi \right)$$