

Масштабування: $L := \text{diam } \Omega$

$$\begin{cases} z_i := \frac{x_i}{\text{diam } \Omega} & i=1, \dots, d \\ |z_i| \leq 1 \end{cases}$$

$$\frac{\partial}{\partial x_i} = \frac{\partial}{\partial (L z_i)} = \frac{1}{L} \frac{\partial}{\partial z_i}$$

$$\nabla_x u = \frac{1}{L} \nabla_z u = \frac{1}{L} \bar{\nabla} u$$

$$\nabla \cdot (\mu \nabla u) = \frac{1}{L} \nabla \cdot \left(\frac{\|\mu\|}{L} \frac{\mu}{\|\mu\|} \nabla u \right) = \left\{ \mu_* := \frac{\mu}{\|\mu\|} \right\}$$

$$= \frac{\|\mu\|}{L^2} \nabla \cdot (\mu_* \nabla u), \quad \|\mu_*\| = 1$$

Підсумки:

$$- \frac{\|\mu\|}{L^2} \nabla \cdot (\mu_* \nabla u) + \frac{\|\beta\|}{L} \beta_* \cdot \nabla u + \|\epsilon\| \epsilon_* u = f \text{ в } \Omega_*$$

або

$$- \nabla \cdot (\mu_* \nabla u) + \underbrace{\frac{\|\beta\| L}{\|\mu\|}}_{P_e} \beta_* \cdot \nabla u + \frac{\|\epsilon\| L^2}{\|\mu\|} \epsilon_* u = \frac{L^2}{\|\mu\|} f \text{ в } \Omega_*$$

$P_e \cdot St$