

Project

Problem 1

Model the average behavior of u^ϵ which satisfies in D

a)

$$-\Delta u^\epsilon + \frac{1}{\epsilon} c\left(\frac{x}{\epsilon}\right) u^\epsilon = f(x),$$

where $\langle c \rangle = 0$, and $u^\epsilon = 0$ on ∂D .

b)

$$-\frac{\partial}{\partial x_i} \left(a_{ij} \left(\frac{x}{\epsilon} \right) \frac{\partial}{\partial x_j} u^\epsilon \right) + \frac{1}{\epsilon} c \left(\frac{x}{\epsilon} \right) u^\epsilon = f(x),$$

where $\langle c \rangle = 0$, and $u^\epsilon = 0$ on ∂D .

c)

$$-\frac{\partial}{\partial x_i} \left(a_{ij} \left(\frac{x}{\epsilon} \right) \frac{\partial}{\partial x_j} u^\epsilon \right) + c \left(\frac{x}{\epsilon} \right) u^\epsilon = f(x),$$

where $u^\epsilon = 0$ on ∂D .