

Errata to the book  
SHAPE OPTIMIZATION BY THE HOMOGENIZATION METHOD  
by Grégoire Allaire

1. Page 23, line 15: “such that  $A^{\epsilon^{-1}}$  converges weakly  $*$  to  $\underline{A}^{-1}$ ...”
2. Page 64, line 16: “For  $f \in L^2(\Omega)$ ...”
3. Page 73, line 17: “then we estimate  $(\nabla u_\epsilon - W^\epsilon \nabla u)$  in the  $L^1(\omega)$  norm”
4. Page 140, equation (2.95) should be replaced by

$$\begin{aligned} & - \int_Y (Ae(\phi) : e(\phi) - 2\chi\eta : e(\phi)) dy \\ &= - \sum_{k \in \mathbf{Z}^N} \left[ 4\pi^2 A(\hat{\phi}(k) \odot k) : (\hat{\phi}(k) \odot k) - 4i\pi \overline{\hat{\chi}(k)} \eta : (\hat{\phi}(k) \odot k) \right] \\ &= - \sum_{k \in \mathbf{Z}^N} \left[ 4\pi^2 \left( \mu_A |k|^2 |\hat{\phi}(k)|^2 + (\mu_A + \lambda_A) (\hat{\phi}(k) \cdot k)^2 \right) + 4\pi \text{Im} \left( \overline{\hat{\chi}(k)} (\eta k) \cdot \hat{\phi}(k) \right) \right], \end{aligned}$$

and the last equation (at the bottom of page 140) by

$$\hat{\phi}(k) = - \frac{i\hat{\chi}(k)}{2\pi\mu_A |k|^2} \left( \eta k - \frac{\mu_A + \lambda_A}{2\mu_A + \lambda_A} \frac{\eta k \cdot k}{|k|^2} k \right),$$

5. Page 144, equations (2.109) and (2.111):

$$\begin{aligned} \frac{\theta}{\kappa_B - \kappa_*} &\leq \frac{1}{\kappa_B - \kappa_A} - \frac{1 - \theta}{2\mu_B + \lambda_B} \\ \frac{\theta}{2(\mu_B - \mu_*)} &\leq \frac{1}{2(\mu_B - \mu_A)} - \frac{(1 - \theta)(N - 1)(\kappa_B + 2\mu_B)}{(N^2 + N - 2)\mu_B(2\mu_B + \lambda_B)}. \end{aligned}$$

6. Page 151, Lemma 2.3.21, the formula for  $h(\eta)$  should be replaced by

$$h(\eta) = \frac{1}{2\mu_B + \lambda_B} \min_{1 \leq i \leq N} \eta_i^2.$$

7. Page 152, equation (2.123) should be replaced by

$$\frac{1}{\mu} (\eta^2 e - 2(\eta e \cdot e)\eta e) + \frac{2}{2\mu + \lambda} (\eta e \cdot e)\eta e = \ell e,$$

and equation (2.124) by

$$\frac{(\eta_p^2 c_p - 2(\eta_i c_i^2 + \eta_j c_j^2)\eta_p c_p)}{\mu} + \frac{2(\eta_i c_i^2 + \eta_j c_j^2)\eta_p c_p}{2\mu + \lambda} = \ell c_p, \quad p = i, j.$$

8. Page 220, line 5 of the proof of Theorem 3.2.6: “and, as a consequence of Theorem 3.2.4”

9. Page 378, line 8: there is a sign error in the denominator of the formulas for  $A_{1111}^*$ ,  $A_{1122}^*$ ,  $A_{2222}^*$ . The correct formulas are:

$$\begin{aligned} A_{1111}^* &= \frac{4\kappa\mu(\kappa + \mu)(1 - \theta)(m_1 + \theta m_2)m_2}{4\kappa\mu m_1 m_2(1 - \theta)^2 + (\kappa + \mu)^2\theta} \\ A_{1122}^* = A_{2211}^* &= \frac{4\kappa\mu(\kappa - \mu)(1 - \theta)^2 m_1 m_2}{4\kappa\mu m_1 m_2(1 - \theta)^2 + (\kappa + \mu)^2\theta} \\ A_{2222}^* &= \frac{4\kappa\mu(\kappa + \mu)(1 - \theta)(m_2 + \theta m_1)m_1}{4\kappa\mu m_1 m_2(1 - \theta)^2 + (\kappa + \mu)^2\theta} , \end{aligned}$$

10. Page 378, line 11: “while  $A_{1212}^* = A_{1211}^* = A_{1222}^* = 0$ .”  
11. Page 438, line 11: remove the name PEDERSEN, P.