Errata to the book

SHAPE OPTIMIZATION BY THE HOMOGENIZATION METHOD

by Grégoire Allaire

1. Page 23, line 15: “such that $A^{-1}$ converges weakly * to $A^{-1}$...”

2. Page 64, line 16: “For $f \in L^2(\Omega)$...”

3. Page 73, line 17: “then we estimate $(\nabla u_\varepsilon - W' \nabla u)$ in the $L^1(\omega)$ norm”

4. Page 140, equation (2.95) should be replaced by

\[ -\int_Y (Ae(\phi) : e(\phi) - 2\chi : e(\phi)) \, dy \]

\[ = -\sum_{k \in \mathbb{Z}^2} \left[ 4\pi^2 A(\hat{\phi}(k) \circ k) : (\hat{\phi}(k) \circ k) - 4i\pi \chi(k) \eta : (\hat{\phi}(k) \circ k) \right] \]

\[ = -\sum_{k \in \mathbb{Z}^2} \left[ 4\pi^2 \left( \mu_A |k|^2 |\hat{\phi}(k)|^2 + \mu_A + \lambda_A \right) \left( \hat{\phi}(k) \cdot k \right)^2 \right) + 4\pi \Im \left( \chi(k)(\eta \cdot \hat{\phi}(k)) \right) \]

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

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

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

\[ \frac{\theta}{\kappa_B - \kappa_*} \leq \frac{1}{\kappa_B - \kappa_A} - \frac{1 - \theta}{2\mu_B + \lambda_B} \]

\[ \frac{\theta}{2(\mu_B - \mu_*)} \leq \frac{1}{2(\mu_B - \mu_A)} - \frac{(1 - \theta)(N - 1)(\kappa_B + 2\mu_B)}{(N^2 + N - 2)\mu_B(2\mu_B + \lambda_B)} \]

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

\[ \frac{1}{\mu} \left( \eta^2 e - 2(\eta e \cdot e) \eta e \right) + \frac{2}{2\mu + \lambda} (\eta e \cdot e) \eta e = \ell e, \]

and equation (2.124) by

\[ \frac{(\eta_i^2 e_p - 2(\eta_i e_i^2 + \eta_j e_j^2) \eta_i e_p)}{\mu} + \frac{2(\eta_i e_i^2 + \eta_j e_j^2) \eta_i e_p}{2\mu + \lambda} = \ell e_p, \quad p = i, j. \]

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:

$$
A_{1111}^* = \frac{4\kappa \mu (\kappa + \mu)(1 - \theta)(m_1 + \theta m_2)m_2}{4\kappa \mu m_1 m_2(1 - \theta)^2 + (\kappa + \mu)^2 \theta m_1 m_2}
$$

$$
A_{1122}^* = A_{2211}^* = \frac{4\kappa \mu (\kappa - \mu)(1 - \theta)^2 m_1 m_2}{4\kappa \mu m_1 m_2(1 - \theta)^2 + (\kappa + \mu)^2 \theta}
$$

$$
A_{2222}^* = \frac{4\kappa \mu (\kappa + \mu)(1 - \theta)(m_2 + \theta m_1)m_1}{4\kappa \mu m_1 m_2(1 - \theta)^2 + (\kappa + \mu)^2 \theta},
$$

10. Page 378, line 11: “while $A_{1212}^* = A_{1211}^* = A_{1222}^* = 0$.”

11. Page 438, line 11: remove the name PEDERSEN, P.