Errata List

Peter Monk

Version of May 21, 2008

Page 10: Fig 1.3. on page 10 and Fig 1.4. on page 11. In the text the electromagnetic properties for the surrounding medium are $\epsilon_r \neq 1$ or $\mu_r \neq 1$. In the captions we say $\epsilon_r \neq 1$ or $\mu_r = 1$! The text is correct.

Page 13: The equation for the cavity resonator in Section 1.4.2 should read

$$\nabla \times (\mu_r^{-1} \nabla \times E) - \ldots$$

Page 20: In the Lax-Milgram lemma, the constant $C$ can be chosen 1.

Page 22, Theorem 2.25: The arguments of $b$ in (2.8a) and (2.8b) need to be reversed. So the general mixed problem should be

$$a(u, \phi) + b(p, \phi) = f(\phi) \text{ for all } \phi \in \mathcal{X}$$

$$b(\xi, u) = g(\xi) \text{ for all } \xi \in \mathcal{S}$$

In addition $f$ and $g$ are conjugate-linear (not linear) functionals (see also Lemma 2.37). These changes propagates throughout Chapter 2 (e.g. (2.11)).

Page 55: Equation (3.41) should read

$$\|v\|_{H(\text{curl}; \Omega)} = \left(\|v\|_{L^2(\Omega)}^2 + \|\nabla \times v\|_{L^2(\Omega)}^2\right)^{1/2}.$$ 

Page 67, before (3.61): “Then obviously $\nabla \Theta_0 \subset K_N(\Omega)$ and we” should be replaced by “Then we” (the inclusion obviously doesn’t hold).

Page 85 (also noted by Professor Nigam) In Theorem 4.3 equation (4.6) the definition of $S$ should read

$$S = \left\{ p \in H^1(\Omega) \mid p = 0 \text{ on } \Gamma \text{ and } p \text{ is constant on } \Sigma \right\}. \text{(4.6)}$$

Page 89 In equation (4.14) should read

$$a_+ (u, v) = (\mu_r^{-1} \nabla \times u, \nabla \times v) + \kappa^2 (\epsilon_r u, v) + i (\lambda u_T, v_T) .$$

Page 93: Proof of Theorem 4.13
• At the start of the proof, $\nabla \times v = i \kappa \epsilon_r u$ should read

$$\nabla \times v = -i \kappa \epsilon_r u.$$ 

• Still in the same proof the displayed equation should read:

$$\Delta v = \epsilon_r \left[ (\nabla^{-1}) \times \nabla \times v - \kappa^2 \mu_r v \right].$$

Page 102, line 10: “chose” should be “choose”.

Page 116: Definition 5.11: The condition for regularity should read that

$$\sigma_h \leq \sigma_{max} < \infty \text{ for all } h \text{ with } 0 < h \leq h_0$$

Page 121: In the 1st line of the proof of Lemma 5.17 $\hat{q} \in \hat{P}_k$ should read $\hat{q} \in \hat{P}_{k-1}$.

Page 123, line 7: “homogeneous of degree $k$” should read “homogeneous of degree $k - 1$”

Page 128: In the proof of Lemma 5.27 $p = (k + 2)x \cdot \nabla p$ should read $p = (k + 1)^{-1}x \cdot \nabla p$.

Page 128: In the proof of Lemma 5.28, $x \cdot \nabla p_2 = kp_2$ should read $x \cdot \nabla p_2 = (k + 1)p_2$.

Page 131: Three lines from the bottom $\hat{\tau}$ should $\tau$.

Page 133: In the 4th line it suffices that $\hat{q} \in P_{k-2}(\hat{f})$

Page 162, equation (6.14): “dA” should be “dV

Page 188, line 6: The equation for $g$ should be

$$g = (\nabla \times E^{\nu}) \times n - i\kappa E^{\nu}_T.$$

Page 217, last line of Section 8.3: “axis” should be “axes”.

Page 280, end of first paragraph: Reference [90] should be [188].

Page 328, line before (12.56): “scatter” should be “scatterer”.

Page 431, reference [60 ] “Theorey” should be “theory”

Page 433: Reference [90] was published in the SIAM Journal on Scientific Computing

Acknowledgments

I would like to thank the following people for submitting errata:

• Professor N. Nigam and students, McGill University

• Dr Wenbin Chen, Fudan University

• Dr Jörn Seaman, Zuken Solutions

2
• Dr Weibing Deng, Nanjing University
• Professor Jay Gopalakrishnan, University of Florida.
• Dr Wim Vanroose, Universiteit Antwerpen
• Dr Ronald Rook, CASA