Theoretical and Computational Seismology

Errata

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Page 44 Equation (1.214) should be

$$\mathfrak{L}_{\mathbf{v}} \boldsymbol{\alpha}^i_j \equiv \mathcal{L}_{\mathbf{v}} \boldsymbol{\alpha}^i_j + \boldsymbol{\omega}^i_k(\mathbf{v})\, \boldsymbol{\alpha}^k_j - \boldsymbol{\omega}^k_j(\mathbf{v})\, \boldsymbol{\alpha}^i_k\,.$$

Page 181 Below equation (3.395) an index j should be an i: $\Psi^i = -\,\frac{1}{2}\,\epsilon^{ijk}\,\Psi_{jk}$

Page 206 Expression (4.116) should read

$$\begin{aligned} L(\partial_t \mathbf{s}, \boldsymbol{\nabla}\mathbf{s}, \boldsymbol{\phi}, \partial_t\boldsymbol{\phi}, \boldsymbol{\nabla}\boldsymbol{\phi}) &= \tfrac{1}{2}\,\rho\,\partial_t\mathbf{s}\cdot\partial_t\mathbf{s} - U(\,\boldsymbol{\nabla}\mathbf{s} - \boldsymbol{\epsilon}\cdot\boldsymbol{\phi}, \boldsymbol{\nabla}\boldsymbol{\phi}\,) + \tfrac{1}{2}\,\partial_t\boldsymbol{\phi}\cdot\mathbf{j}\cdot\partial_t\boldsymbol{\phi} \\ &= \tfrac{1}{2}\,\rho\,\partial_t\mathbf{s}\cdot\partial_t\mathbf{s} + \tfrac{1}{2}\,\partial_t\boldsymbol{\phi}\cdot\mathbf{j}\cdot\partial_t\boldsymbol{\phi} \\ &\quad - \tfrac{1}{2}\,(\boldsymbol{\nabla}\mathbf{s} - \boldsymbol{\epsilon}\cdot\boldsymbol{\phi}) : \boldsymbol{\Gamma} : (\boldsymbol{\nabla}\mathbf{s} - \boldsymbol{\epsilon}\cdot\boldsymbol{\phi}) - \tfrac{1}{2}\,\boldsymbol{\nabla}\boldsymbol{\phi} : \boldsymbol{\Gamma}_c : \boldsymbol{\nabla}\boldsymbol{\phi}. \end{aligned}$$

Page 206 Expressions (4.124) and (4.125) should read

$$\boldsymbol{\sigma} = \frac{\partial U}{\partial \boldsymbol{\nabla}\mathbf{s}} = \boldsymbol{\Gamma} : (\boldsymbol{\nabla}\mathbf{s} - \boldsymbol{\epsilon}\cdot\boldsymbol{\phi}),$$

$$\boldsymbol{\sigma}_c = \frac{\partial U}{\partial \boldsymbol{\nabla}\boldsymbol{\phi}} = \boldsymbol{\Gamma}_c : \boldsymbol{\nabla}\boldsymbol{\phi},$$

Page 206 The κ_c referred to above (4.130) should be λ_c.

Page 261 Expression (6.3) should read

$$A\,\partial_t^2 s + 2\,B\,\partial_t\partial_x s + C\,\partial_x^2 s + D\,\partial_t s + E\,\partial_x s + F\,s + G = 0\,.$$

Page 273 In Problem 6.10, it should say “where Δt is between 0.4 and 0.6”.

Page 277 Expression (6.115) should read

$$C \le 1/2\pi\,.$$

Page 289 Expression (7.67) should be

$$F_A = f_2^{A-1} + f_1^A\,,$$

Page 290 Spurious c at end of (7.75).

Page 291 In the first line of Section 7.3.2 it should say “time-dependent” heat equation.

Pages 299–302 The integrations from 0 to 1, $\int_0^1$, in (7.118), (7.120), (7.124), (7.131), (7.135) should be replaced by integrations over an element Ω, $\int_\Omega$.

Page 509 In expressions (G.111) and (G.112), $\mathfrak{L}_{\mathbf{u}}$ should be $\mathcal{L}_{\mathbf{u}}$, such that

$$\mathcal{L}_{\mathbf{u}}\boldsymbol{\alpha} = \mathrm{d}(\mathbf{u}\cdot\boldsymbol{\alpha})\,,$$

and

$$\mathcal{L}_{\mathbf{u}}\mathrm{f} = \mathbf{u}\cdot\mathrm{df}\,.$$

Page 516 Expression (G.168) should read

$$\begin{aligned}
\mathfrak{L}_{\mathbf{u}}\boldsymbol{\alpha}^i_j &\equiv \mathbf{i_u}\mathrm{D}\boldsymbol{\alpha}^i_j + \mathrm{D}(\mathbf{i_u}\boldsymbol{\alpha}^i_j\,) \\
&= \mathbf{i_u}\mathrm{d}\boldsymbol{\alpha}^i_j + \boldsymbol{\omega}^i_k(\mathbf{u})\,\boldsymbol{\alpha}^k_j - \boldsymbol{\omega}^k_j(\mathbf{u})\,\boldsymbol{\alpha}^i_k - \boldsymbol{\omega}^i_k \wedge \mathbf{i_u}\boldsymbol{\alpha}^k_j + \boldsymbol{\omega}^k_j \wedge \mathbf{i_u}\boldsymbol{\alpha}^i_k \\
&\quad + \mathrm{d}(\mathbf{i_u}\boldsymbol{\alpha}^i_j\,) + \boldsymbol{\omega}^i_k \wedge \mathbf{i_u}\boldsymbol{\alpha}^k_j - \boldsymbol{\omega}^k_j \wedge \mathbf{i_u}\boldsymbol{\alpha}^i_k \\
&= \mathcal{L}_{\mathbf{u}}\boldsymbol{\alpha}^i_j + \boldsymbol{\omega}^i_k(\mathbf{u})\,\boldsymbol{\alpha}^k_j - \boldsymbol{\omega}^k_j(\mathbf{u})\,\boldsymbol{\alpha}^i_k\,.
\end{aligned}$$

Page 519 Expression (G.183) should read

$$\begin{aligned}
\mathrm{D}\mathfrak{L}_{\mathbf{u}}\boldsymbol{\alpha}^i - \mathfrak{L}_{\mathbf{u}}\mathrm{D}\boldsymbol{\alpha}^i &= \mathrm{D}^2(\mathbf{i_u}\boldsymbol{\alpha}^i\,) - \mathbf{i_u}\mathrm{D}^2\boldsymbol{\alpha}^i \\
&= -\,(\mathbf{i_u}\mathbf{r}^i_j) \wedge \boldsymbol{\alpha}^j\,.
\end{aligned}$$