

Corrections to "Introduction to Modeling Convection in Planets and Stars" by Gary A Glatzmaier (Princeton Univ Press)

Page 64, last line: change "than" to "then".

Page 65, middle of page: change " $k_s = [0.7$ " to " $k_s = [0.75$ ".

Page 92, in the first sentence of the last paragraph: replace "3D spectral density-stratified spherical-shell model of mantle convection (Glatzmaier, 1988)" with "3D spherical-shell model of mantle convection (Baumgardner, 1985; Glatzmaier, 1988)".

Page 102, 4 lines from bottom: replace "equals to number" with "equals the number".

Page 119, Eq. 10.8: The signs on the two terms on the right each need to be reversed.

Page 121: in the sentence starting in the 8th line replace "The final configuration (Fig. 10.1c, at time 0.1)" with "The configuration at time 0.1 (Fig. 10.1c)". Later in that paragraph replace "(at the final configuration)" with "(at 0.1 diffusion time)". Near the end of this paragraph replace "possibly a diffusion time or more" with "typically several diffusion times". Also, add the following to the end of this paragraph: "Try running this example three or more diffusion times, tracking its total kinetic energy, to see if Fig. 10.1c is actually the final steady state or if the simulation will eventually evolve to yet another (possibly time dependent) state."

Page 190, Chp 11, exercise 3: in the equation replace " $\partial \mathbf{Z}^\pm$ " with " \mathbf{Z}^\pm " and in the text replace " \mathbf{Z}^\pm , q , and ν^\pm " with " \mathbf{Z}^+ , \mathbf{Z}^- , ν^+ , ν^- , and q ".

Page 194, first sentence of Section 12.1: Add "Verhoeven et al., 2015" to the list of references.

Page 199, Eq 12.18: the reference state gravitational acceleration on the far left of this equation should be in bold to indicate it is a vector.

Page 204: replace Eq. 12.36 and the text between Eqs. 12.35 and 12.36 with the following: "and the rate pressure does work per volume is

$$(\bar{p} + p) \nabla \cdot \mathbf{v},$$

where here $\nabla \cdot \mathbf{v}$ is obtained by starting with the full mass conservation equation because the anelastic energy equation is scaled to order M^3 (J. Verhoeven, private communication; Verhoeven et al., 2015)."

2

Page 205: replace Eq. 12.38 with the following:

$$\begin{aligned} \bar{\rho}c_p \frac{\partial T}{\partial t} = & -\bar{\rho}c_p \mathbf{v} \cdot \nabla T - \rho c_p v_z \frac{d\bar{T}}{dz} - \bar{\rho}c_p \left[\frac{d\bar{T}}{dz} - \left(\frac{d\bar{T}}{dz} \right)_{AD} \right] v_z \\ & + \left(\frac{\partial p}{\partial t} + \mathbf{v} \cdot \nabla p \right) + \nabla \cdot (c_p \bar{\kappa} \bar{\rho} \nabla T) + \bar{Q} + Q. \end{aligned}$$

Page 211, first line after Eq 12.62: change "with ξ vanishing at π " to "with Θ vanishing at $\xi = \pi$ ".

Page 222 (last line on page): change "aspect ratio of 2" to "aspect ratio of 0.75".

Page 295: for the 3rd citation, replace "II Reactions" with "III Reactions". Also, add the following citation: Baumgardner, J.R. 1985. Three-dimensional treatment of convective flow in the Earth's mantle. *J. Statist. Phys.* 39, 501-511.

Page 302: for the Lui et al. article, the journal page numbers should be 653–664.

Page 305: Add the following citation. Verhoeven, J., Wieshofer, T. & Stellmach, S. 2015. Anelastic versus fully compressible turbulent Rayleigh-Benard convection. *Astrophys. J.*, 805, 1-14.

Color Plate 5: in the figure caption: remove "(see Color Plate 5 for color version of this figure)".