

Contents

Part I Upper Mantle and Transition Zone

1 Global Heterogeneity of the Lithosphere and Underlying Mantle: A Seismological Appraisal Based on Multimode Surface-Wave Dispersion Analysis, Shear-Velocity Tomography, and Tectonic Regionalization	3
A.J. Schaeffer and S. Lebedev	
2 Origin of Lateral Heterogeneities in the Upper Mantle Beneath South-east Australia from Seismic Tomography	47
N. Rawlinson, B.L.N. Kennett, M. Salmon and R.A. Glen	
3 Imaging Mantle Heterogeneity with Upper Mantle Seismic Discontinuities	79
Nicholas Schmerr	
4 Interpreting Radial Anisotropy in Global and Regional Tomographic Models	105
Thomas Bodin, Yann Capdeville, Barbara Romanowicz and Jean-Paul Montagner	
5 Relationships Between Seismic Wave-Speed, Density, and Electrical Conductivity Beneath Australia from Seismology, Mineralogy, and Laboratory-Based Conductivity Profiles	145
A. Khan, S. Koch, T.J. Shankland, A. Zunino and J.A.D. Connolly	
6 Heterogeneity of Electrical Conductivity in the Oceanic Upper Mantle	173
Tomoo Katsura and Takashi Yoshino	

7	Melt Pockets and Spongy Clinopyroxenes in Mantle Xenoliths from the Plio-Quaternary Al Ghab Volcanic Field, NW Syria: Implications for the Metasomatic Evolution of the Lithosphere	205
	George S.-K. Ma, Kuo-Lung Wang, John Malpas, Yoshiyuki Iizuka, Costas Xenophontos, Abdulsalam A. Turkmani, Gavin H.-N. Chan, Tadashi Usuki and Queenie H.-S. Chan	
8	Elasticity of Continental Crust Around the Mantle Transition Zone	259
	Kenji Kawai and Taku Tsuchiya	
9	Effect of Water on Subduction of Continental Materials to the Deep Earth	275
	Hiroki Ichikawa, Kenji Kawai, Shinji Yamamoto and Masanori Kameyama	

Part II Lower Mantle

10	The Composition of the Deep Earth	303
	Edouard Kaminski and Marc Javoy	
11	Chemical Geodynamics in a Non-chondritic Earth	329
	Guillaume Caro	
12	Seismic Detections of Small-Scale Heterogeneities in the Deep Earth	367
	Sebastian Rost, Paul S. Earle, Peter M. Shearer, Daniel A. Frost and Neil D. Selby	
13	Seismic Detection of Post-perovskite Inside the Earth	391
	Laura Cobden, Christine Thomas and Jeannot Trampert	
14	Thermally Dominated Deep Mantle LLSVPs: A Review	441
	D.R. Davies, S. Goes and H.C.P. Lau	
15	Large-Scale Thermo-chemical Structure of the Deep Mantle: Observations and Models	479
	Frédéric Deschamps, Yang Li and P.J. Tackley	
Index		517