

Contents

1	Introduction	1
	Niklaus Kämpfer	
Part I In Situ Sensors		
2	Thin Film Capacitive Sensors	11
	Herman Smit, Rigel Kivi, Holger Vömel and Ari Paukkunen	
3	Balloon-Borne Frostpoint-Hygrometry	39
	Holger Vömel and Pierre Jeannet	
4	Application of Fluorescence Method for Measurements of Water Vapour in the Atmosphere	55
	Vladimir Youshkov	
Part II Remote Sensing Sensors		
5	Microwave Radiometry	71
	Niklaus Kämpfer, Gerald Nedoluha, Alexander Haeefele and Evelyn De Wachter	
6	Fourier Transform Infrared Spectrometry	95
	Matthias Schneider, Philippe Demoulin, Ralf Sussmann and Justus Notholt	
7	Lidar	113
	Thierry Leblanc, Thomas Trickl and Hannes Vogelmann	
Part III Networks and Global Monitoring		
8	Role of Ground-based Networks and Long-term Programmes for Global Monitoring	161
	Geir O. Braathen	

9	Satellite Sensors Measuring Atmospheric Water Vapour	175
	Joachim Urban	
10	Combining and Merging Water Vapour Observations: A Multi-dimensional Perspective on Smoothing and Sampling Issues	215
	Jean-Christopher Lambert, Coralie de Clercq and Thomas von Clarmann	
11	Survey of Intercomparisons of Water Vapour Measurements	243
	Klemens Hocke, Lorenz Martin and Niklaus Kämpfer	
	Appendix A: Fact Sheets	289
	Appendix B: Equations for Saturation Vapour Pressure	315
	Appendix C: List of Acronyms	325