

Preface

Recognizing the important role of water vapour for atmospheric processes and in climate issues the steering committee of the Network for the Detection of Atmospheric Composition Change (NDACC) set up a task group to carefully analyse the different measuring and retrieval techniques for water vapour. This working group on water vapour met in 2006 for the first time at the University of Bern in Switzerland. Different measurement techniques for water vapour, in situ and remote, have been discussed. Special emphasis has been put on strengths and weaknesses of the different techniques, on the aspect of validation and inter-comparison of data obtained by different instruments and on detailed specifications of the different methods. It soon turned out that too many aspects remained unanswered and that a thorough investigation of the different issues asked for an in depth analysis.

It turned out that this could ideally be achieved in the frame of a so called science team of the International Space Science Institute, ISSI (www.issibern.ch). ISSI is an Institute of Advanced Studies where scientists from all over the world meet in a multi- and interdisciplinary setting to reach out for new scientific horizons. The main function is to contribute to the achievement of a deeper understanding of the results from different space missions, ground based observations and laboratory experiments, and adding value of those results through multidisciplinary research in the framework of International Teams, Workshops, Working Groups, Forums or as individual Visiting Scientists. The program of ISSI covers a widespread spectrum of disciplines from the physics of the solar system and planetary sciences to astrophysics and cosmology, and from Earth sciences to astrobiology. A dozen of experts in water vapour measurement techniques met three times as a so called ISSI international team at the ISSI facility in Bern discussing in detail above mentioned issues.

It has been decided to summarize the outcome of these discussion in the form of a book in the ISSI series of scientific reports. Individual chapters have been written by the team members and sent out to external experts in the field for a critical review. Special thanks goes to these reviewers (S. Bekki, B. Connor, J. Hannigan, D. Kley, M. Kurylo, J. Langen, N. Livesey, L. Miloshevich, S. Oltmans, A. Parrish, D. Whiteman, J.R. Russell III) who helped a lot to improve the quality of the book.

In parallel to the activities in the frame of the ISSI project also a working group of the COST project WAVACS (Atmospheric Water Vapour in the Climate System)

dealt with the topic of water vapour measurement. Discussions between the team members of this COST project and particularly discussions during workshops of this COST project stimulated some of the authors from the ISSI project and had direct influence on the content of some of the book chapters. Particularly the interactive tables about information of the cross validation of different sensors are accessible through www.watervapour.org is the outcome of this joint effort.

Last but not least very special thanks go to René Bleisch from the Institute of Applied Physics, University of Bern, who did the complete compilation of the book in LATEX based on the material that has been submitted in the most different and exotic forms of typesetting.

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