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Remote Sensing of Clouds and the Atmosphere XIV

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Introduction

The fourteenth conference on Remote Sensing of Clouds and the Atmosphere was held in Berlin, Germany, as part of SPIE *Europe* Remote Sensing 2009. The conference included 55 papers divided into six oral sessions and poster sessions. The areas covered were cloud remote sensing; middle/upper-atmosphere remote sensing; radiative transfer; lidar, radar, and passive atmospheric measurement techniques; profiling of aerosols, trace gases, and meteorological parameters; and spectrometric methods, including FTIR and DOAS.

The papers presented included a broad range of methodologies from basic theoretical principles of atmospheric phenomena and remote-sensing techniques to end-user applications of remote-sensing products.

Sensing in space and on the ground, as well as critical enabling technologies and disciplines, were all addressed. Space-based remote sensing is well suited to producing global data products and investigating relatively large scale phenomena. Current satellite instruments have matured and are producing a number of useful data products. On the other hand, ground-based measurements are complementary to space-based sensors, providing means to investigate small-scale and local phenomena. By forming networks of ground-based instruments, coordinated data over extended regions (and perhaps eventually over regions of global extent) can be obtained. Effective coordinated measurements among sensors of a ground-based network and also between ground-based and space-based sensors depend on accurate cross-calibration methods and, often also, on the availability of powerful computational facilities.

Remote sensing is most often, but not always, mediated by electromagnetic radiation, in a large frequency range between the radio-wave and x-ray regions. Hence, the principles of radiative transfer are fundamental to remote-sensing applications, and deeper understanding of radiative transfer leads to insight into new improved means of sensing. Considerable progress is occurring in 3-D radiative transfer, with attention to more complex geometries and boundary conditions.

The future may hold a significant opportunity to expand small-scale measurements to remote or difficult-to-reach areas through reliance on a broader range of platforms, including; ships, aircraft, unmanned aerial vehicles, and micro/nano/pico-satellites, and networks or formations of such platforms.

These proceedings contain the reviewed and revised papers corresponding to the conference presentations. Papers based on poster presentations are divided into the same categories as those based on oral papers.

We would like to thank the authors for the very high quality of their papers and thank the SPIE staff for their invaluable work in the organization of the conference and the editing of these proceedings.

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