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Remote Sensing and Modeling of the Atmosphere, Oceans, and Interactions II

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Introduction

This two day session covered the area of remote sensing and applications for atmosphere ocean modeling and their interactions. Remote sensing has become a major data provider for atmosphere ocean modeling in the last several decades. Instruments mounted on satellites are providing detailed information on the vertical profiling for many variables such as total vertical content for aerosols, dust, water vapor, and liquid water. In addition, we are currently able to monitor ocean temperatures, cloud cover, precipitation, ice and snow contents on land, and surface wind speeds. Many weather centers carry detailed data assimilation methods for each such satellite component. Over the years weather prediction has seen large impacts in the improvements of forecast skills from the deployment of these satellite based data components in their operations. This two day session of SPIE covered several important areas.

Session 1 covered radiative transfer issues from the use of the AIRS/AQUA profiles of temperature and humidity of the NASA A-TRAIN satellites. This is an important area for research and operations. The southern hemisphere operations benefit most from these data sets because of the voids from conventional observations over the vast oceans and the Antarctic. Session 2 addressed the topic of vertical heating profiles from satellites and models. This is recognized as an area where the life history of weather and climate systems see large modeling errors because of errors in the vertical placement of the levels of maxima, the amplitudes and geographical distributions. The papers in Session 2 are important contributions defining the current state of research on this topic. Session 3, on pollution and modeling, is timely and addressed a major component of global change. Pollution from North America, Europe, and Asia impacts many parts of the globe. The direct and indirect effects of radiative transfer, transports of pollution over large distances, its dry and wet deposition and their modeling aspects are some of the most important research areas presently. A number of Asian participants in Session 4 examined the impacts of remote sensing on the monsoons of the world. Those are areas where remote sensing is important because of the convective nature of precipitation that is not easily monitored by conventional observations. Session 5 covered the area of tropical cyclones. Here the impacts of remote sensing for the understanding and modeling of the atmosphere and the ocean are large. The LASE instrument provides vertical profiles of humidity and aerosols, which are being analyzed in the context of hurricanes to examine the development versus non-development in different situations. Finally, we included a number of papers in our poster session that cover the same above five areas. We expect these topics to provide a current state of the art in remote sensing and for the related atmosphere-ocean modeling.

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