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CLIMATE/ATMOSPHERIC SCIENCE & ENGINEERING COLLOQUIUM

Observations of Atmospheric Aerosol Properties and Their Use to Constrain Models at Various Scales

Dr. Jens Redemann, University of Oklahoma

- Friday, May 21, 2021 | 2 p.m. | Via Zoom
- Free Registration: <https://uiowa.zoom.us/meeting/register/tJAucu2upjkvHtauTGFZWhR7iVLPCKOl62by>

(Registration takes less than a minute. A confirmation email will follow with instructions to join the event.)



ABSTRACT:

Accurate observations of atmospheric aerosol properties at ambient conditions are crucial prerequisites to the validation of atmospheric models, and to the combined use of models and observations for studying the evolution of aerosol properties during transport and their resulting impacts on climate. This talk will present recent suborbital observations of atmospheric aerosols from a selection of field deployments. I will provide examples of airborne observational efforts using recently developed and improved radiation instrumentation, e.g., the Spectrometer for Sky-Scanning, Sun-Tracking Atmospheric Research (4STAR) and the Solar Spectral Flux Radiometer (SSFR), and describe how results from the radiation instruments compare to more conventional in situ observations of aerosol properties, including aerosol absorption. Based on the combined data sets, I will show comparisons of observed aerosol properties to climate and chemical transport models, with an emphasis on the South-East Atlantic region. Based on a few case studies, I will then showcase how newly collected remote sensing data sets are used to develop novel aerosol retrieval algorithms, using polarimeter and lidar measurements as retrieval inputs. I will describe the significance of various aerosol properties for the scientific objectives of the NASA ACCP (Aerosols, Clouds, Convection and Precipitation) project, recommended by the 2017 Decadal Survey. In this context, I will present new joint lidar-polarimeter retrieval simulation results that have been produced in support of the ACCP designated observable study to help investigate potential satellite architectures and instrument combinations for the NASA ACCP mission. The talk will conclude with a brief overview of the School of Meteorology at the University of Oklahoma and the many opportunities that exist for graduate studies and future scientific collaborations.

BIO:

Jens Redemann is the Director of the School of Meteorology at the University of Oklahoma. He is a Professor in the School and holds the Mark and Kandi McCasland Endowed Chair in Meteorology. Until July 2018, he was a Physical Research Scientist in the Atmospheric Science Branch at NASA Ames Research Center. He received an MS in Physics from the Free University of Berlin in 1995, and an MS and PhD in Atmospheric Sciences from UCLA in 1996 and 1999, respectively (but he wishes he had a better understanding of Behavioral Psychology). In his career, he has led several groups of scientists and engineers, with the goal of making “model-relevant” observations of aerosol-cloud-climate interactions. He has authored more than 100 peer-reviewed journal articles on aerosols and clouds. He was the PI for the NASA Earth-Venture-Suborbital-2 project ORACLES (ObseRvations of Aerosols above CLouds and their intEr-actionS), which according to Forbes magazine is the NASA mission with “arguably ... the worst acronym ever”.

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