University at Buffalo
Department of Electrical Engineering
School of Engineering and Applied Sciences

POLARIMETRIC AEROSOL AND CLOUD REMOTE SENSING –

RADIATIVE TRANSFER AND INVERSION MODEL DEVELOPMENT

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Abstract: Aerosols and their interactions with clouds are major sources of uncertainty in climate forcing. A polarimeter that measures both the radiance and polarization of scattered light has proven to be highly valuable in improving remote sensing capabilities. In this presentation, I will introduce the progress of our group in developing radiative transfer and inversion models for aerosol and cloud remote sensing. I will also discuss their application in analyzing polarimetric data from both airborne and satellite sensors. Specifically, I will a) discuss the benefits of multi-angle polarimetry; b) introduce the modeling of polarized radiative transfer from ultraviolet to infrared; and c) demonstrate the observation of polarimetric cloudbow shift and the associated retrieval of cloud droplet size.

Bio Dr. Feng Xu is an associate professor with School of Meteorology at the University of Oklahoma. His research interests include atmospheric radiative transfer modeling and remote sensing inversion. He leads the development of Level-2 aerosol retrieval algorithm for NASA's EVI Instrument – Multi-Angle Imager for Aerosols. He also developed a Markov chain model for computing polarized radiative transfer in a coupled atmosphere-surface system. Dr. Xu serves as an editor/associate editor of Journal of the Atmospheric Sciences and Journal of Quantitative Spectroscopy and Radiative Transfer, and is a member of the Algorithm Working Group of NASA ATMOS mission.

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