

Use of Lidars in Atmospheric Sciences

Presenting author: Dr. Richard Medina

NCAS NOAA Center for Atmospheric Sciences, Howard University

Coauthors: Dr. Demetrius Venable

Presenting Author e-mail: richard.medinacalde@howard.edu

Coauthor e-mail: dvenable@Howard.edu

In-situ measurement of atmospheric composition as well as optical parameters provide valuable information for climate and atmospheric radiation processes. Remote sensing instruments play a significant role in the detection of these parameters and today the use of lasers for range and particle detection has become obligatory in almost all atmospheric research centers in the world. In this sense, Lidars (Light Detection and Ranging), for example, are pulse lasers that were created for long range detection purposes in both spatial and temporal dimensions.

The Lidars operating in the NOAA Center for Atmospheric Sciences (NCAS) at Howard University, Beltsville Campus in Maryland are in-situ instruments that provide us with values of aerosol backscattering coefficients, water vapor mixing ratios, nitrogen concentrations and cloud heights.

In this presentation, the uses and benefits of the Lidars Vaisala CL31, CL51, CT12k, and Raman are shown for the campus area. Also, data from the Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation (CALIPSO) satellite are compared with these

instruments and results are presented for selected days.

These studies will allow a better understanding of our ability to monitor the atmosphere and provide efficient methods to estimate the environmental impact of high concentration of pollutants and water vapor.