

## **The Clio HSRL Instrument Concept for the NASA AOS Mission**

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NASA Langley Research Center (LaRC) has designed the Clio High-Spectral-Resolution Lidar (HSRL) instrument concept for NASA's Atmospheric Observing System (AOS). The AOS mission is being developed by NASA in response to the recommendation of the National Academy of Sciences Decadal Survey for Earth and Space Sciences and addresses two of the five core missions recommended through the Decadal Survey process: a mission focused on aerosol impacts on climate and air quality and a mission focused on the global hydrological cycle and cloud-climate feedbacks. The AOS mission implementation, which follows the NASA Aerosol-Cloud-Convection-Precipitation (ACCP) Study recommendations, includes several instruments deployed in two orbital planes, one inclined and one polar. Clio is planned for deployment to the polar orbit plane along with a Doppler radar, microwave radiometer, polarimeter, and an imaging spectrometer and contributes to both the aerosol and cloud science foci of the mission. In this paper, we will describe the Clio instrument concept and its science capabilities and contrast Clio's performance, information content, and accuracy to that of LaRC's Cloud-Aerosol Lidar with Orthogonal Polarization (CALIOP) lidar deployed on the Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation (CALIPSO) mission.