Contribution ID: **21** Type: **Talk**

The ARGOS Instrument for Stratospheric Aerosol Measurements

Observations of aerosol distributions in the Earth's stratosphere represent a key input for Earth system models that need to characterize atmospheric heating. These aerosol measurements need good vertical resolution to capture variations in horizontal transport, dense spatial sampling to capture local structure, and regular temporal sampling to follow the evolution of aerosol injections at a specific location. We have developed the Aerosol Radiometer for Global Observations of the Stratosphere (ARGOS) satellite instrument to make these measurements. ARGOS measures scattered light from the Earth's limb in 8 directions simultaneously to provide improved spatial coverage compared to current instruments. Overlapping samples at many locations along the orbit with variable scattering geometry will help to characterize the aerosol phase function. Concurrent observations at two near-IR wavelengths (870 nm, 1550 nm) provide altitude coverage down to the upper troposphere, and enable derivation of additional information about particle size distribution. All measurements are captured on a single focal plane with an image sensor that provides < 1 km vertical resolution to enable better representation of horizontal transport processes in the atmosphere. ARGOS was launched for a technology demonstration flight as a hosted payload in March 2025. Results from on-orbit operations will be presented.

Topic

Upcoming Earth observation limb and occultation instruments

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