

Laboratory mass extinction and size distribution measurements of volcanic ash aerosol

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This presentation details laboratory measurements of the mass extinction coefficient and size distribution of dispersed volcanic ash aerosol from a wide range of samples collected globally. These eruption specific measurements can be directly applied to improve satellite remote sensing retrievals of mass columnar concentration. The experimental apparatus dispersed volcanic ash in nitrogen gas into an aerosol chamber and used two optical systems to measure spectral extinction over a broad range of wavelengths: a Fourier transform spectrometer made measurements in the infrared, and two diffraction grating spectrometers made measurements covering ultraviolet and visible wavelengths. The combined spectral range was 0.34 – 19 microns. Simultaneously, the size distribution of particles exiting the chamber was measured using a scanning mobility particle sizer (SMPS) and an optical particle counter (OPC). The SMPS and OPC covered the full particle size distribution. The results of these experiments will be presented, and will demonstrate significant variation in the extinction properties of ashes from different eruptions, particularly associated with the SiO_2 absorption feature at 9.5 microns.