

Pan-divisional Seminar

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*“Model Tropospheric
Aerosols: Optical
Properties and
Internal Structure*

The role of aerosols in atmospheric processes is the largest uncertainty in modeling climate. Aerosol particles impact the radiative budget of the Earth directly through their interactions with radiation, and indirectly through their effects on clouds. To better understand the aerosol direct effect, we have investigated the optical properties of model tropospheric aerosols composed of binary mixtures of dicarboxylic acids and ammonium sulfate. Specifically, we have used the new and sensitive technique of cavity ring-down aerosol extinction spectroscopy to retrieve effective refractive indices for aerosol particles. We find that the experimental refractive indices do not agree with volume-weighted average refractive indices, which are commonly used in models. The maximum increase in scattering seen experimentally corresponds to a 40% change in radiative forcing compared with the volume-weighted average refractive indices. Our results suggest that the aerosol particles have complex internal structures. As a consequence, I will discuss the use of atomic force and Raman microscopies for investigating the internal structures of aerosols composed of organic compounds mixed with ammonium sulfate.

Special Seminar

DATE: MONDAY, DEC. 7

TIME: 3:30 P.M., RM 1315