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# *DETERMINATION OF CHEMICAL COMPOSITION OF MARINE AEROSOL PARTICLES AND ITS EFFECTS ON AEROSOL AND CLOUD PROPERTIES DURING THE 2005 MASE FIELD CAMPAIGN*

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**ABSTRACT**

Marine stratus clouds play an important role in earth radiation budget. The cloud microphysics in terms of size distribution and liquid water concentration which govern the aerosol indirect radiative effects is influenced in part by chemical composition of the pre-existing aerosol particles. While anthropogenic pollution can result in clouds that are brighter and longer-lived, enhancing the cooling effect, the presence of soluble components such as sea-salt and organic acids on the other hand can negate part of these effects. To investigate the role aerosol particles play in the properties of marine stratus clouds, we measured aerosol and cloud properties on board the DOE G1 aircraft in the marine atmosphere in the coastal region between Point Reyes and Monterey Peninsula, California in the month of July as part of the 2005 Marine Stratus Experiment (MASE, http://www.asp.bnl.gov/MASE/, supported by the DOE Atmospheric Science Project and the Atmospheric Radiation Measurement program). Aerosol chemical composition was measured using a PILS-IC and an Aerodyne AMS. The PILS-IC measured sodium, chloride, ammonium, nitrate, sulfate, potassium, calcium, magnesium, methanesulfonic acid, and format/acetate. The time resolution was 4 min and the limit of detection was ca. 0.2 microgram per cubic meter. The AMS measured total organic compounds as well as ammonium, nitrate and sulfate at a one-minute time resolution. Other aerosol properties measured included size distribution, light scattering, light absorption and cloud condensation nuclei concentration, and cloud properties including cloud droplet size and liquid water concentration. We will report the chemical composition of aerosol particles and the mechanisms governing their distributions. The relationships between aerosol chemical composition and aerosol and cloud properties will be investigated.