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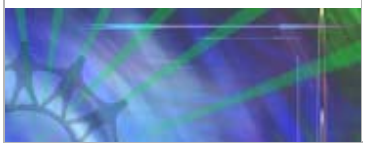

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Award Abstract #0449815

CAREER: Aerosol Properties and Effects through Organic Aerosol Characterization, Integrated Analysis of Multi-Instrument Data, and Aerosol-Cloud Nucleation Closure

NSF Org:	AGS Division of Atmospheric and Geospace Sciences
Initial Amendment Date:	January 31, 2005
Latest Amendment Date:	March 5, 2009
Award Number:	0449815
Award Instrument:	Continuing grant
Program Manager:	Alexander A.P. Pszenny AGS Division of Atmospheric and Geospace Sciences GEO Directorate for Geosciences
Start Date:	February 15, 2005
Expires:	January 31, 2011 (Estimated)
Awarded Amount to Date:	$721333
Investigator(s):	Jose Jimenez jose.jimenez@colorado.edu (Principal Investigator)
Sponsor:	University of Colorado at Boulder 3100 Marine Street, Room 481 Boulder, CO 80309 303/492-6221
NSF Program(s):	COLLABORATIVE RESEARCH, ATMOSPHERIC CHEMISTRY
Field Application(s):	0000099 Other Applications NEC
Program Reference Code(s):	OTHR, 5952, 4444, 1045, 0000
Program Element Code(s):	7298, 1524

ABSTRACT

Aerosols have important effects on climate, visibility, human health, and acid, toxic, and nutrient deposition. The research objectives of this CAREER project address the need for a better understanding of aerosol processes, chemistry, and microphysics. The organic aerosol component will be better characterized and quantified by further developing the organic aerosol separation and quantification procedure recently developed by the PI's group for analyzing Aerodyne Aerosol Mass Spectrometer (AMS) data. This method will be systematically applied to worldwide AMS measurements obtained by many groups, and the types and origins of organic aerosols observed will be analyzed. In addition, a

more complete characterization of the aerosol properties will be obtained by further extending a recently developed software system for integrated analysis of multi-instrument data. Furthermore, prediction of cloud condensation nuclei (CCN) from the aerosol properties ("closure") will be attempted by augmenting ongoing field campaigns with CCN measurements; using modified Kohler theories and measurement results to predict CCN, and systematically analyzing the degree of closure achieved between predicted and measured CCN. This project will leverage resources from other programs that will support the basic field measurements and analysis, and allow the PI to perform CCN measurements and a much deeper level of analysis than possible with the limited resources obtainable for individual field campaigns.

The broader impacts of this scientific program lie in furnishing critically needed information on organic aerosols and submicron aerosol climatic effects that can inform scientific assessments and, through them, policy decisions; and an improved characterization of the AMS and its organic data, which will benefit the many other research groups currently using it.

The education objectives of this CAREER program are: outreach to K-12 teachers by participation in a teaching training program; participation of minority undergraduate students in research; development of an interactive undergraduate environmental chemistry course; development of an experimental component for an atmospheric chemistry course; graduate student training in research with opportunities for mentoring and involvement in fieldwork, international, and industrial activities.

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April 2, 2007
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