

AD-A255 678



4

"CCN SPECTRA MEASUREMENTS AS AN ACTIVE TRACER
OF STRATOCUMULUS MECHANISMS"

Annual Report for Office of Naval Research

November 1991 - October 1992

Principal Investigator:

James G. Hudson
Desert Research Institute
University of Nevada System
Reno, Nevada 89506-0220

DTIC
ELECTE
SEP 23 1992
S A D

This document has been approved
for public release and sale; its
distribution is unlimited.

September 1992

92 9 16 078

254875
DEFENSE TECHNICAL INFORMATION CENTER
9225371
8 pgs

**ANNUAL REPORT FOR OFFICE OF NAVAL RESEARCH
NOVEMBER 1991-OCTOBER 1992**

BY JAMES G. HUDSON

The paper "Transport and Mixing Processes in the Lower Troposphere over the Ocean" by Ilga Paluch and Don Lenschow of NCAR, Hudson of DRI, and Pearson of NASA Ames was published in the May issue of J.G.R. The paper "Cloud Condensation Nuclei Near Marine Cumulus" by J.G. Hudson was submitted to J.G.R. in May. The paper has been conditionally accepted and the revised version was submitted September 4. This paper presents the spatial distribution of CCN in HaRP. Comparisons and contrasts with FIRE (Hudson and Frisbie, 1991) show that there seems to be a reservoir of particles within the free troposphere which is probably the source of boundary layer CCN. Differential gravitational settling of cloud droplets results in coalescence scavenging of CCN which results in lower concentrations in the cloudy boundary layer. This is an important feedback effect between clouds and the atmospheric aerosol. This has important implications for entrainment processes.

A paper comparing the CCN and cloud droplet concentrations in FIRE is under preparation and should be completed before the end of this project period. This shows that variations in updraft velocity at cloud base interact with the CCN spectrum to produce differences in droplet concentrations and size distribution which can lead to the development of larger drops which produce precipitation and thus coalescence scavenging which in turn affects the CCN spectrum.

Many of these results were presented at the International Cloud Physics and Precipitation Conference in Montreal and the Nucleation Conference in Salt Lake City in August, 1992.

The paper on the CVI-CCN measurements in HaRP is being completed with Dr. Cindy Twohy of NCAR. Results of these measurements demonstrate the portions of the CCN spectrum which actually produce cloud droplets. These results can be interpreted in terms of cloud entrainment processes which affect the droplet spectrum.

The DRI CCN spectrometer obtained data throughout all of the 17 flights of the NCAR Electra during ASTEX in June. This produced a rich and abundant data set which included more CVI-CCN intercomparisons.

Accession: F01	
NTIS CRAB	✓
DTIC TAB	
Unannounced	
Justification	
By <i>per</i> A246499	
Distribution	
Availability	
Dist	Avail
A-1	Spec

DTIC QUALITY INSPECTED 3