

RACORO



Routine

ARM Aerial Facility (AAF)

Clouds with Low Optical Water Depts (CLOWD)

Optical

Radiative

Observations

Website

<http://acrf-campaign.arm.gov/racoro/>

Science and Operations Plan

<http://www.arm.gov/publications/programdocs/doe-sc-arm-0806.pdf>

E-mail List

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ARM STM Poster 13.H

RACORO Objectives

- ❖ Conduct long-term, systematic flights in boundary layer, liquid-water cloud fields at the SGP measuring:
 - Microphysical properties
 - Optical properties and radiative fluxes
 - Aerosol properties & Atmospheric state

- ❖ The data needed to:
 1. Validate ACRF Remotely-Sensed Cloud Properties
 2. Investigate Aerosol-Cloud Interactions
 3. Improve Cloud Simulations in Climate Models

Challenges

- ❖ These clouds are often thin and/or broken, making retrievals uncertain
 - Necessitates long-term obs for good statistics
 - 1st time, long-term aircraft in situ sampling of clouds
- ❖ **“Routine”**
 - Operations → Simplified operation paradigm
 - Instrumentation selection
 - Robust/reliable
 - Low maintenance
 - Simple/routine processing
 - Low weight & power
 - Prefer**
 - Fast response
 - Large sampling volumes
 - Approach**
 - Pair a slow, accurate measurement w/ a fast, precise one

Operations



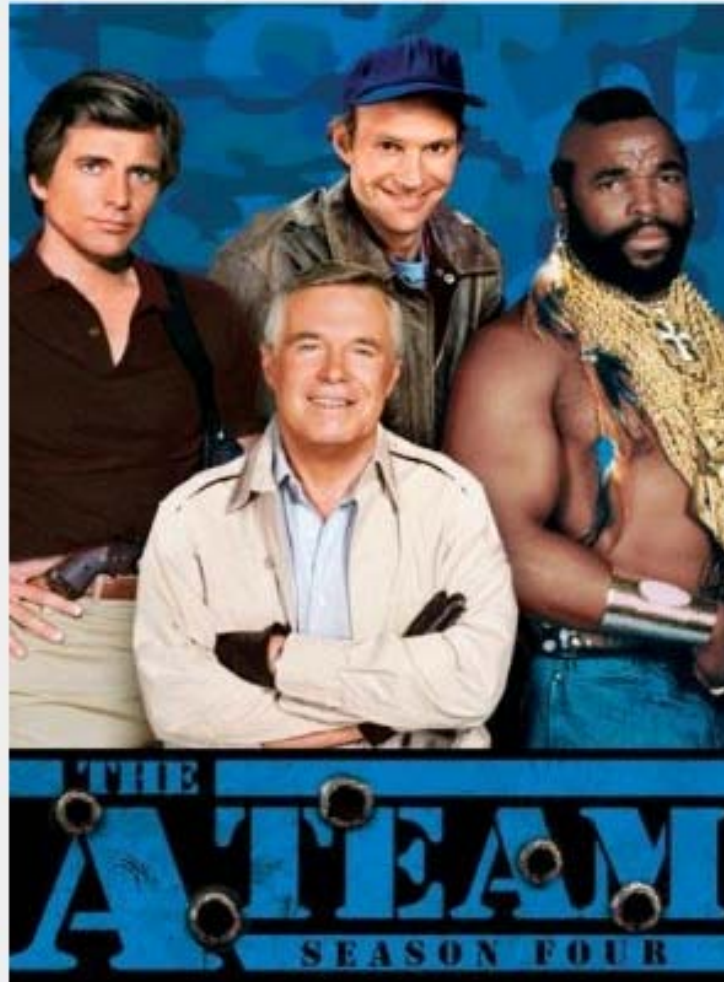
- **Field period: 22 January to 30 June 2009**
- **Frequency : 2-3 times a week (4-5 hrs each)**
- **QC'd data in archive: 1 January 2010**

Payload

CATEGORY	MEASUREMENT	INSTRUMENT	PRINCIPAL INVESTIGATOR
CLOUD MICROPHYSICS	Liquid-Water Content	Particle Volume Monitor-100A	CIRPAS
		SEA Liquid-Water Content Probe	CIRPAS
	Drop Size Distribution	Forward Scattering Spectrometer Probe-100	CIRPAS
		Cloud Aerosol Precipitation Spectrometer	CIRPAS
		2D Cloud Imaging Probe)	CIRPAS
		2D Stereo Probe	Paul Lawson
Cloud Extinction	Cloud Integrating Nephelometer	Hermann Gerber	
RADIATION	Broadband fluxes	↑↓ Shortwave Kipp & Zonen	Anthony Bucholtz & Chuck Long
		↑↓ Longwave Kipp & Zonen	Anthony Bucholtz & Chuck Long
		↑ SPN-1	Anthony Bucholtz & Chuck Long
	Spectral fluxes	↑↓ Multi-filter Radiometer	Anthony Bucholtz & Chuck Long
		↑↓ HydroRad-3	Anthony Bucholtz & Chuck Long
	Spectral Radiances	↑ or ↓ HydroRad-3	Anthony Bucholtz & Chuck Long
		↑↓ Infrared Thermometer	Anthony Bucholtz & Chuck Long
AEROSOL	Cloud Condensation Nuclei	Dual-Column CCN Spectrometer (0.2% SS, Scan 0.8-0.2% SS)	CIRPAS
	Number Concentration	Ultrafine Particle Counter	CIRPAS
		2 Condensation Particle Counters	CIRPAS
	Size Distribution	Scanning Differential Mobility Analyzer	Don Collins
		Passive Cavity Aerosol Spectrometer Probe	CIRPAS
METEOROLOGY	Temperature	Rosemount Probe	CIRPAS
		Vaisala Probe	CIRPAS
	Water vapor	Chilled Mirror Hygrometer	CIRPAS
		Diode Laser Hygrometer	Glenn Diskin
	Wind-Turbulence and Updraft velocity	Gust probe	CIRPAS
Conditions	Flight video	CIRPAS	

- Interdisciplinary
- Some redundancy
- Some new things

Power to the People!



People Power

Steering Committee

Andy Vogelmann, Greg McFarquhar, John Ogren, Dave Turner,
Jennifer Comstock, Graham Feingold, Chuck Long

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IOP Share

Chaomei Lo, Raymond McCord, Dave Still

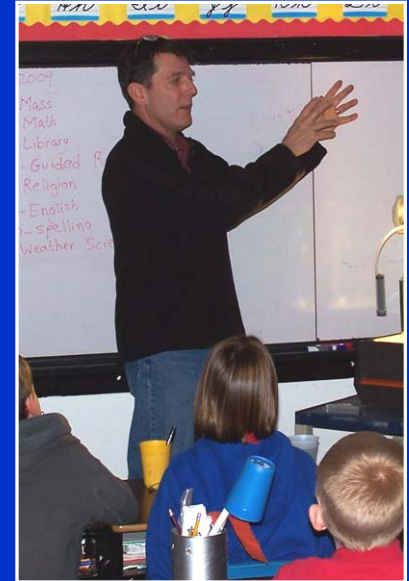
AAF POCs



**Debbie
Ronfeld**



**Jason
Tomlinson**



**John
Hubbe**

- Synoptic Summary (Daniel Hartsock)
- Operations (Jason Tomlinson)
- Instrument status (John Hubbe)
- Discussion

RACORO Wiki

- “Command Center”
- SGP quicklooks
- Running flight journal
- Aircraft quicklooks
- Data QC