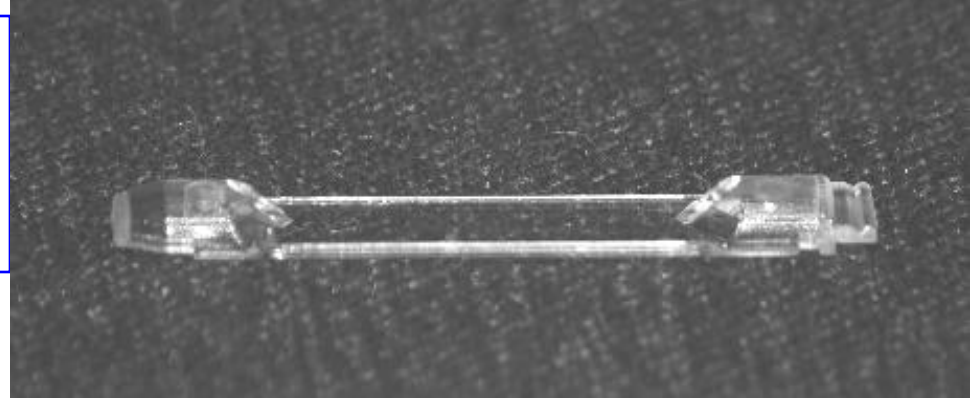


Jorgen Jensen

Sampling of giant aerosol particles
during ICE-T



Objectives:

Sampling of dust particles at altitude for determining the size spectrum of mineral dust (and detrained salt)

Sampling of sea-salt particles (and dust) in inflow air in the mixed layer below cloud base

Focus some flights on high-wind conditions in the mixed layer

Take most slides as normal slides; use some for Jim Anderson analysis

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Objective 1: Sampling of dust particles at altitude for determining the size spectrum of mineral dust (and detrained salt)

Sampling can only be done outside cloud and not in precipitation regions

On both dusty and non-dusty days, sample to characterize the mineral (or rather non-sea-salt) particle spectra

Sample for several minutes if possible (particles expected to occur in relatively low concentrations at altitude)

Sample a relatively high fraction ($\sim 1/3$) for electron microscopy using carbon-tape or normal slides

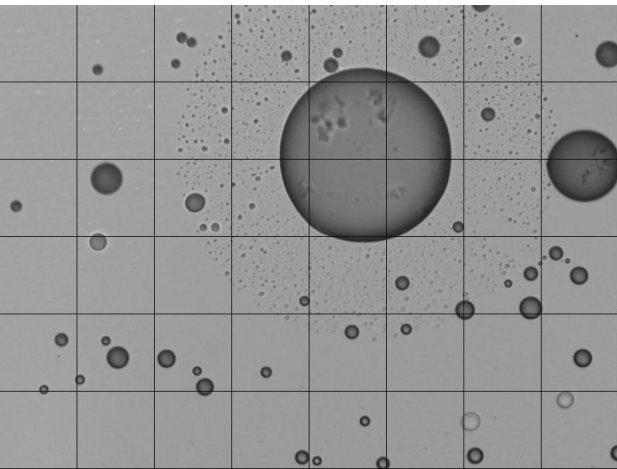
Sampling of giant aerosol particles during ICE-T

Objective 2: Sampling of sea-salt particles (and dust) in inflow air in the mixed layer below cloud base

Focus on sea-salt particles – these will dominate the size distribution and mineral dust is likely a small contributor

Expose for 10 s to avoid overloading

Develop algorithm to determine presence of inclusions in salt particles (e.g. dust, organic material, shells)



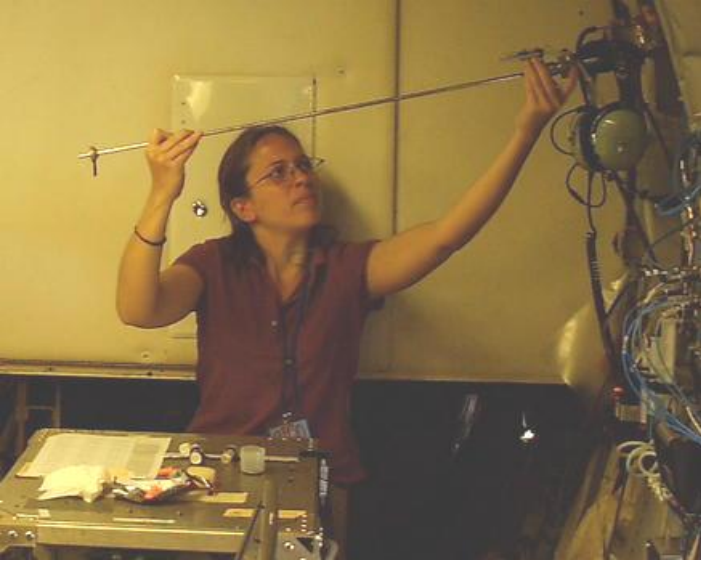
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Objectives: Focus some flights on high-wind conditions in the mixed layer

High-wind marine conditions (15-50 m/s) are not well sampled for sea-salt particles.

There will be vastly more and larger salt particles in comparison to low wind speed conditions. Does this in any way change the rate of ice formation? (e.g. slow down the rate of ice nucleation)

Ferry to outer region of intense tropical clusters or depressions. This may take a bit extra time, but make it a focus of the flight strategy.



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Objective: Stay safe!

Cumulus clouds could be turbulent in comparison to RICO; deeper clouds will be targeted by ICE-T

Standing in front of first RHS rack is necessary when exposing slides.

Take great care handling manual GNI stick. Coordinate with pilots.

Sampling of giant aerosol particles during ICE-T

Number of slides: ~50 exposed on a 4-hour flight.

Analyzed data: size distributions, bin width of 0.2 μm dry radius (for salt). For non-salt, ambient size at 91% RH.

Data freely available for modeling and other studies. Jørgen expects to do some modeling of warm cloud droplet growth using , but currently no ice processes (ice only in other versions).
Looking for collaborations.

Down-looking video image data: Analyze to determine white-cap fraction.

There are methods to do that fairly simply. I do not know how good the image data will be, but I expect flight 5 minutes duration at 500 ft to be adequate to give good analysis. One image every 5 secs. I have lots of tools available from the GNI analysis that can readily be used for the white-cap analysis.

Thank you!