SPIN

SPECTROMETER ICE NUCLEI

DROPLET MEASUREMENT TECHNOLOGIES

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Rev D-1

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OVERVIEW

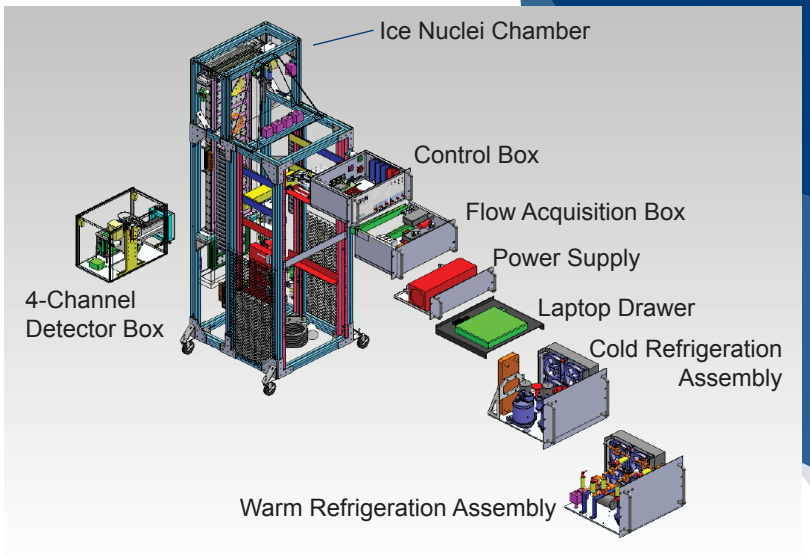
The DMT CCN counter has expanded the capability of researchers to understand aerosol-cloud interactions for warm clouds. Missing from the capability of researchers so far, however, has been the easy ability to study ice cloud nuclei. The SPectrometer for Ice Nuclei (SPIN) fills this gap. The SPIN is the first commercially available IN counter, with a particle detection range from 0.8 – 20 µm. Particle detection allows for individual particle sizing and discrimination of ice and water particles using polarization change in the scattered light.

APPLICATIONS

- Ice nuclei efficiency studies
- Cloud physics research
- Weather modification

SOFTWARE

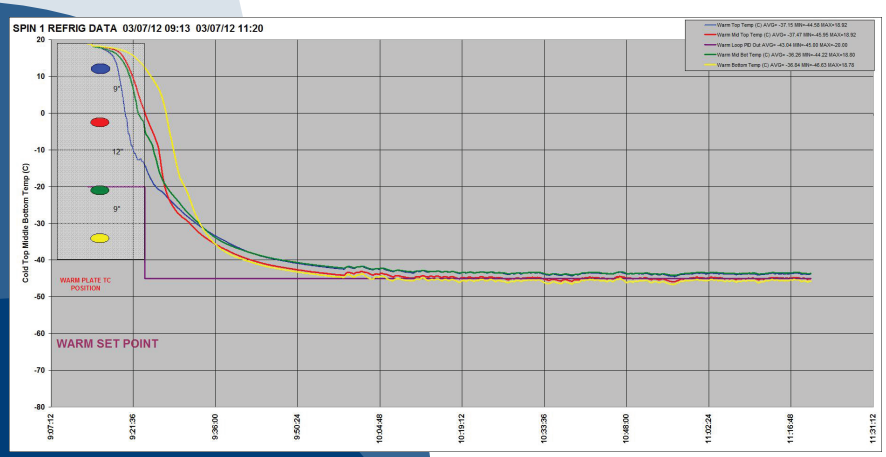
The SPIN is controlled by fully integrated software that presents an intuitive user interface. This interface provides real-time display of measured and calculated data and instrument status, and allows the configuration of the instrument's operating parameters.



SPECIFICATIONS

- Particle detection range of 0.8 – 20 µm
- Polarization change discrimination of particle phase
- Particle residence time in chamber of 10 -12 seconds
- Parallel-plate chamber geometry
- Full computer control of all systems; automated operation for unattended measurements
- Self-contained, compact refrigeration system:
  - Cold-plate temperature to -70° C
  - Warm-plate temperature to -40° C
- Self-contained in a single rack, 59 cm wide x 73 cm deep x 167 cm high
- Power requirements: 220 VAC, 50/60 Hz, 3000 W or 28 VDC, 3000 W

RESULTS: COOLING DATA



HOW IT WORKS

The SPIN's chamber design follows the parallel-plate geometry developed by Stetzer and the engineering team at the ETH-Zurich. Details are given in Stetzer et. al., (Atmos. Chem. Phys., 11, 4725-4738, 2011). The parallel-plate design provides easy and uniform cooling. A compact refrigeration system cools the plates directly, eliminating the need for external cooling baths and heat exchange fluids.

The SPIN consists of the following components:

- The *Ice Nuclei Chamber* contains the refrigerated plates with an ice layer to grow the crystals.
- The *Flow Acquisition Box* contains the pumps, data acquisition system, and mass flow controllers.
- The *Control Box* contains electronics such as pump controls.
- The *Warm and Cold Refrigeration Assemblies* contain the compressors that drive refrigerant into the plates.
- The *Detector Box* consists of the laser, two standard light-scattering detectors and two polarized light detectors. The polarized light detectors allow discrimination of ice particles from other particles.

INCLUDED ITEMS

- Instrument
- On-site installation and training
- Operator manual
- Email and phone technical support

HOW TO ORDER

Contact DMT for pricing or more information: +1.303.440.5576, customer-contact@dropletmeasurement.com.