

Overview

In order to reduce the weather impacts on agriculture, the North Dakota Atmospheric Board supports the North Dakota Cloud Modification Project and has an interest in determining the effectiveness of cloud seeding. The ICE Flare Testing Project is being conducted in order to determine the effectiveness of seeding material (ice nuclei) produced by Ice Crystal Engineering LL (ICE) manufactured flares by testing cloud seeding flares in existing cloud chambers such as the PI Cloud Chamber at Michigan Technological University. The flare burning and dilution system is built by Weather Modification International and tests are conducted at the University of North Dakota to determine the size and concentration of particles produced by burning flares.

Testing of Flare Burning System at UND CCNC (0.6 %), SMPS (10-500 nm) **CPC (> 10 nm)**













Agl Flare Burning with 100 knot Wind **10 April 2017, 06:14 UTC, Sample 99** 500 Diameter (nm) Particle Diameter [nm]

Results

- Flares can be easily tested in the lab environment
- AgI flares produce approximately 25-40 nm diameter
- AgI flares activate as CCN at 0.6% supersaturation.
- An air filter is needed in front of the blowers in order to reduce particle pollution from the blowers
- Longer flares are needed for longer burning time in order to

Future Work

A blower filter system is needed in order to conduct more lab experiments at UND and longer flares will need to be used during testing. Once the lab experiments are completed at UND, the next step is to conduct the first series of tests in the PI Cloud Chamber at Michigan Technological University.

Acknowledgements

Raymond Shaw – Showing the Pi Cloud Chamber (MTU)

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