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Poster Title: Size Distribution and CCN Activation Ratio of Bacteria Ghosts
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Abstract: Ice Nuclei (IN), Silver Iodide (AgI) cloud seeding flares and Bacterial Ghosts (BG) are being tested at the University of North Dakota to determine their size distribution and cloud condensation nuclei (CCN) spectrum. Using an indoor flare burning system developed at the University of North Dakota, AgI flares are burned and the air sampled is diluted for measurements by a variety of instruments. The first preliminary tests have shown that AgI flares produce 25-40 nm particles and activate as CCN at 0.6% super saturation. Bacteria Ghosts, which are empty cell membranes, carrying ice nucleation proteins, have recently been found to help induce ice nucleation. To determine the lab properties of BG and their effectiveness as immersion ice nuclei, a solution of ultra-pure water and bacteria ghosts is used to generate aerosols using a TSI atomizer. The size distribution is measured using a TSI Scanning Mobility Particle Sizer Spectrometer (SMPS) and a TSI Aerodynamic Particle Sizer. Using a DMT Cloud Condensation Nuclei Counter (CCNC) and a TSI Condensation Particle Counter (CPC), the ratio of the CCNC to CPC measurements determines how effective the ice nuclei is as a CCN which is important to determine their effectiveness as an immersion ice nuclei. These lab experiments help to understand how the ice nuclei should act in clouds, which will be tested by introduction of the generated sample into a Cloud Chamber.