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**Title:** An Experiment Designed to Test Ice Nucleation of Silver Iodide Cloud Seeding Flares using the Pi Cloud Chamber

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**Abstract:**

The Pi Cloud Chamber at Michigan Technological University is used to conduct an exploratory experiment to test Silver Iodide (AgI) cloud seeding flares. A long-lasting cloud is generated by operating the Pi Cloud Chamber in thermal-gradient mode. The objective is to repeat previous experiments conducted using expansion mode chambers on the effectiveness of ice nuclei produced by AgI seeding flares. Ice nucleation effectiveness is determined by measuring how fast ice forms when seeding material is introduced into a super-cooled cloud environment. The experiment indicates that ice nucleation occurs faster at a temperature of -11 °C than at -5.8 °C, and no measurable ice is found to occur at -3.2 °C. More ice particles form with approximately 500 cm<sup>-3</sup> droplet concentration than with approximately 80 cm<sup>-3</sup> droplet concentration; therefore, contact nucleation is a primary process for ice nucleation of particles produced by the cloud seeding flares. These results are consistent with past experiments conducted using the Colorado State, expansion type, cloud chamber. The turbulent nature of the clouds generated resulted in large variability of droplet and ice concentrations. The small sample volume of the Welas optical particle counter and the large natural variability resulted in noisy data that made determination of a time constant for ice formation very problematic. Hence, future experiments need to use an improved instrument to measure ice concentration within the Pi Cloud Chamber.