

Review of “Design of a Dual-Tank Mixed Cloud Chamber and Quantitative Seeding Experiments for Warm and Cold Clouds”

General Comment:

This manuscript presents a dual-tank expansion-type cloud chamber designed to investigate warm and cold cloud microphysics, focusing primarily on laboratory-scale cloud seeding. The authors clearly outline the experimental setup, instrumentation, and two illustrative case studies, effectively demonstrating the facility’s capabilities. This chamber represents a valuable tool for the cloud physics and weather modification communities. The manuscript is generally well-written, and I would like to recommend for acceptance after the following minor comments are addressed.

Comments

Comment 1: Although the authors introduce a dual-tank cloud chamber designed to improve pressure control during expansion, they do not present results or analysis demonstrating the active use of chamber A. I suggest that the authors include discussion or data analysis illustrating the operation and performance when Tank A is utilized.

Comment 2: Line 16: A short explanation is required for “chamber B”. Readers might get confused when they will just read the abstract.

Comment 3: Line 96: Could authors explain the term open-closed state?

Comment 4: Lines 138–139: The authors should clarify the term “homemade” to confirm whether the equipment was custom-built in-house. Furthermore, while Figure 2 presents calibration results for select instruments, data for the “CPC-W003; homemade” unit are missing and should be provided. Finally, please state the sample size used to determine the uncertainty statistics in Figure 2, and clarify the measurement uncertainty associated with both the mode and mean particle concentrations.

Comment 5: Line: 241: In both cases, ambient air served as the source for the background aerosol; specifying its characteristics such as hygroscopic properties would provide valuable context for the reader.

Comment 6: Line 273–275: Sentence may need rephrasing.

Comment 7: Line 283: How fog droplet size is different from cloud droplet size?

Comment 8: Line 285: The authors should justify the role of collision–coalescence in the chamber or provide relevant literature citations. Given the particle size range observed, it seems

unlikely that collision–coalescence would initiate.

Comment 9: The authors note that the observations are consistent across both warm and cold cloud-seeding experiments. I suggest citing key references that support these findings and expanding the discussion to further explain the results from both cases.