

We thank **Referee#1** for reviewing also the revised manuscript. We corrected all the mistakes and confusing formulation listed by the Referee.

We would like to thank **Referee#4** for reviewing our manuscript. In the following we reply to the Referee's comments.

• **Line 9 (Abstract): Suggest clarifying "The lower detection limit..." and correcting the formatting to "30  $\mu\text{m}$ ".**

For the sake of clarity, we revised the sentence to only mention the upper end of the detection limit (30  $\mu\text{m}$ ), which sufficiently represents the sensitivity of our setup. We also corrected the unit.

• **Line 10 (Abstract): For better flow, consider moving the sentence "Our results revealed a strong dependency..." to follow the sentence "The observed number of fragments varies..."**

Thank you for the suggestion, we modified the abstract accordingly.

• **Line 21: To clarify the discrepancy, explicitly state that observations show "more ice crystals than ice nucleating particles (INPs)". Table 1: The RH range is given as 92-100%. Could the authors explain the reason for the range? Was it measured or controlled? Slight variations in RH could potentially influence surface properties or sublimation effects. Remove double dash between 92 and 100.**

The observations showing this discrepancy are presented or cited in the publications given at the end of the sentence. The Ladion 2017 study, for instance is an observational study showing the discrepancy between INP and ice crystal concentrations. The GEORG facility utilizes a continuous stream of supercooled droplets carried with an air flow at around 3 m/s. We measured the dew point at the place where the graupels are growing. Because of the fluctuation caused by the inhomogeneous distribution of droplets, and the slightly fluctuating temperature, we could only estimate the relative humidity with respect to ice from the measured dew point values. This is the reason why a range for RH is provided. The double dash has been removed.

• **Lines 100-102: Ice spheres were generated at  $-70^{\circ}\text{C}$  and then equilibrated at experiment temperatures. Does the initial very low freezing temperature potentially influence the internal structure (e.g., bubble concentration/distribution) compared to spheres frozen directly at  $-5^{\circ}\text{C}$  or  $-15^{\circ}\text{C}$ , possibly affecting fragility?**

Yes, that might be possible. Our aim was to generate ice spheres with a density of bulk ice, and to avoid any fluctuations in the structure. For that, freezing water at low temperature, so thus, also quickly, seemed to be the proper way. This limitation of the experiment is now added to Section 5.

• **Line 118: Correct formatting to add space: " $0.46 \text{ g cm}^{-3}$ ".**

Done.

• **Table 2: Consider simplifying the table by showing repeated values (e.g., fixed particle size) only once or using grouping. What is the uncertainty associated with the CKE values? Please reduce CKE values to a maximum of two significant digits for consistency and clarity.**

We chose this representation of the table because the particle pairs are varying. In our opinion, grouping the repeated values would make the table more confusing. The uncertainty of the CKE values was 4.3%, which is now also provided in the text.

**• Table 2 & Table 3: Suggest combining Table 2 (experimental conditions) and Table 3 (fragment results) into a single table. This would allow readers to more easily connect the collision parameters with the resulting fragment numbers and sizes for each experiment series.**

We decided to present the experimental conditions and the results in two distinct tables. Merging the tables would indeed allow a direct view of the collision parameters and the resulting fragment numbers, but it would make the table too big and probably reduce the overall readability.

**• Table 4: For consistency and clarity, please format the uncertainties using the "value  $\pm$  uncertainty" notation. Also, reduce the number of significant digits for A, C, and their uncertainties to a maximum of two.**

We modified Table 4 following the Referee's suggestion.

**• Lines 181-182: When discussing structural integration, explicitly reference the figures mentioned: "...structurally more integrated (see Fig. 1b) than the ones produced at  $-15^{\circ}\text{C}$  (Fig. 1a)..."**

Corrected. Thank you for finding this.