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Discussions

Interactive comment on "Characterization and first results from LACIS-T: A moist-air wind tunnel to study aerosol-cloud-turbulence interactions" *by* Dennis Niedermeier et al.

Anonymous Referee #2

Received and published: 3 December 2019

General Comment: This manuscript presents the newly developed turbulent moist-air wind tunnel, called the Turbulent Leipzig Aerosol Cloud Interaction Simulator (LACIS-T). LACIS-T is able to study different cloud processes taking into account interactions between turbulence and cloud microphysical processes. Additionally, the authors complemented their LACIS-T experiments with Computational Fluid Dynamics (CFD) simulations to explain their observations. The behavior of the LACIS-T was tested by performing deliquescence and hygroscopic growth as well as droplet activation and growth experiments using NaCl particles.

This is as well written manuscript, with a very detailed descriptions of this newly devel-

oped turbulent moist-air wind tunnel. The LACIS-T is a great and valuable instrument for the cloud physics community that can be used to fulfill many gaps in knowledge. Given the lack of instruments like this, LACIS-T can have a huge impact in the near future. I congratulate the authors for developing such a great instrument and for the careful characterization. I only have one "Major Comment". The manuscript can be accepted after the following minor comments are added to the revised manuscript.

Major Comment: It would have been nice to add a reference experiment, especially for the droplet activation experiments. I mean, is it possible to run a droplet activation experiment under steady conditions, i.e., without any turbulence? This will show how monodisperse is the droplet size distribution (DSD) in comparison to the DSD shown in Figure 12.

Minor Comments: L19: Add a reference after "Earth". L20: Add a reference after "interactions". L24: Add a reference after "scales". L28: I suggest to add other references in addition to Siebert et al. (2006). L28: "It links to phase transition processes". Do the authors refer to "turbulence"? L34: Add a reference after "undertaking". L37: I suggest to add other references in addition to Stratmann et al. (2009). L40: How about Cziczo et al. (2017)? L44-49: I do not think it is necessary to cite all this previous papers. L50: I think "those of the other" should be "those of other". L51: Add a reference after "interactions". L62-73: Much of the information provided here can go into methods. L104: "to remove aerosol particles". In the particle-free air? L137: "Condensational" should be "Condensation". L140: Delete "and" before 200. L259-260: "Large Eddy Simulations" should be "LES". L302: I suggest to change it to "Figs. 5a-c" L333 and 335: "RMS" should be in lowercase? L398: "size-selcted" should be "size-selected".

Reference: Cziczo, D. J.; Ladino, L. A.; Boose, Y.; Kanji, Z. A.; Kupiszewski, P.; Lance, S.; Mertes, S.; Wex, H. Measurements of Ice Nucleating Particles and Ice Residuals. In Ice Formation and Evolution in Clouds and Precipitation: Measurement and Modeling Challenges; American Meteorological Society, 2017; Vol. 58, pp 8.1−8.13

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