Responses to the Reviewer 2 comments
(comments in black, responses in red)

This technical note introduces a visualization framework for analyzing aerosol/cloud particle trajectories in thermodynamic/water phase space, with a specific application to outputs from dynamical models that employ Lagrangian particle-based approaches. Examples from two different environments (idealized atmospheric cloud vs. laboratory chamber cloud) are given to show how differences in the driving dynamics map onto the phase diagram, allowing prospective adapters to see for themselves how the proposed approach differentiates dynamical regimes. This note is a valuable addition to the literature and I recommend it for publication after the following comments are addressed.

We appreciate the positive evaluation of our submission.

Comments

L82-83: Is it commonly known that "large CCN typically lag the environmental RH increase"? I.e., is this something that one would know after reading a canonical text like Pruppacher and Klett or Yau and Rogers? If not, could you provide a citation supporting this statement?

We do not think this is a common knowledge, but it is appreciated by those who study CCN deliquescence and activation. It has been mentioned in the introduction to Grabowski et al. (2022b) and illustrated by the simulations there. The part of the text the reviewer refers to has changed. Per Reviewer 1 suggestions, we added a discussion of that aspect and included references to Mordy (1959), Chuang et al. (1997), and Nenes et al. (2001). The revised text reads (Eq. 2 is the droplet growth equation added per Reviewer 1 suggestion):

"This can be shown by considering time scale characterizing droplet growth that can be taken as r over dr/dt. Neglecting the impact of the equilibrium supersaturation S_{eq} in (2), the droplet growth time scale is proportional to r^2 (see the derivation in Mordy 1959 that considers the impact of S_{eq} on the droplet growth time scale). Chuang et al. (1997) puts the droplet growth time scale in the context of the time scale characterizing the environmental supersaturation change as, for instance, in the rising adiabatic parcel. Such considerations are further refined in Nenes et al. (2001) that discusses time-scale limitations that may or may not lead to eventual activation of a given CCN together with a possible deactivation of already activated cloud droplets."

Section 3, paragraph 1 (L153-163): I don't think you say explicitly in this model description paragraph that you're using an implementation of the super-droplet method. This would be helpful, even though it should already be obvious.

We added the following sentence:

"Lagrangian particle-based microphysics (Shima et al. 2009) is applied to represent deliquesced CCN and activated cloud droplets."

L227 and Fig. 5, left panel x-axis label: Why do you use droplet radius to describe particles that may or may not in fact be water droplets? Would it make more sense to use the general "particle radius?"

We do not understand this comment. All "particles" throughout the manuscript are water droplets, either haze droplets (i.e., deliquesced CCN) or cloud droplets (i.e., activated CCN).

L250, 256, 258: GKY24 became GYK24. Please correct.

Corrected. This was also spotted by the Reviewer 1.

L250: Following the setup of one of the laboratory experiments (add "the")

Added. Thanks.