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Atmospheric Chemistry and Physics Discussions

Interactive comment on "The validity of the kinetic collection equation revisited – Part 2: Simulations for the hydrodynamic kernel" *by* L. Alfonso et al.

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Reply to Reviewer # 1

First, we would like to thank the anonymous referee for his/her comments that will improve the quality of our paper. Our revised version will include several of his/her suggestions.

General comments:

1) Breakup of droplets:

For the simulations presented in this paper, the largest droplets (runaway droplets) at the start of the runaway growth have a size between 25-40 μm in radius.

1. First simulation for the product kernel with an initial concentration equal to 100 cmˆ(-3): The radius of the runaway droplet at t=1335 sec. was found to be equal to 37.5 μm.

2. Second simulation for the hydrodynamic kernel with an initial concentration of 100 cmˆ(-3): The radius of the runaway droplet at t=860 sec. was found to be equal to 28.5 μm.

3. Third simulation for the hydrodynamic kernel with an initial concentration of 200 cmˆ(-3): The radius of the runaway droplet at t=450 sec. was found to be equal to 36.9 μm.

Then, the runaway drop sizes obtained in the three simulations are smaller than the typical collision breakup drop size. As we know, spontaneous breakup occurs once a diameter of approximately 3 mm is reached. The runaway drop sizes are also smaller than the typical sizes involved in the collision induced breakup mechanism. A brief discussion of this point will be included in the final revised version.

2) Hydrodynamic kenel: In the revised version, the claim that the hydrodynamic kernel is realistic will be tuned down as suggested by the reviewer.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 6219, 2010.