We thank all reviewers for useful comments. We would like to note that we found a minor bug in the program used for ANT calculations. After fixing the bug, the adsorption site distances used for calculating the coagulation nucleation curves in Fig. 4 are 4.2 and 4.4 nm instead of 3.6 and 3.8 nm. This change does not affect the discussion and conclusions in any way.

**J. C. Corbin**

*To this very interesting work, I would like to suggest that the authors briefly address the role of contact region between soot spherules (also known as monomers) in their discussion. Since real soot particles typically contain at least a few spherules, menisci between these spherules may alter the curvature of any condensed phase water. While this well-known phenomenon (Butt and Kappl, 2009) is probably outside of the scope of the present work, it may be worthwhile to note at what point and by approximately what degree it might alter the authors' conclusions. For example, since capillary menisci form below saturation, how would the authors conclusions change for a particle in which capillary condensation is normally imagined? I do realize that the macroscopic phenomenon of capillary condensation is not treated by a nucleation theory. I also realize that experimental data have already been presented. Hence, I expect that only a brief comment would be necessary to clarify this question. I apologize if such a comment was already made, and I missed it. One might also hypothesize that the junctions between soot spherules may be important in the sense of being either more or less heterogeneous than the spherules. However, I am not aware of experimental evidence in support of this hypothesis.*

*Reference:Butt,Hans Jürgen,and Michael Kappl.2009."Normal CapillaryForces."Advances in Colloid and Interface Science 146 (1–2):48–60.https://doi.org/10.1016/j.cis.2008.10.002.*

We would like to thank Dr. Corbin for this useful insight. There are two factors impacting possible capillary condensation. The first is that the contact angle we use is nearly 90 degrees, which means that a meniscus cannot in practice be concave, which in turn implies that capillary condensation will not occur at undersaturation. The second is the primary spherule sizes. Palas soot primary spherules have diameters on the order of 5-10 nm. Crouzet and Marlow (Aerosol Sci. Tech. 22, 43-59, 1995) have modelled the nucleation of pendular water ring formed around the contact point of two equal sized spheres. It can be read from their Fig. 6 and Table 2 that when contact angle is 85 degrees, the supersaturation required for nucleation to occur is about 8%. However, this is when the sphere radius is 50 nm. It can also be seen from Table 2 that the critical supersaturation increases rapidly with sphere radius; for 200 nm spheres it would be just 2%. We can thus conclude that with Palas soot, it is unlikely that this type of capillary nucleation would take place at significantly lower supersaturation than we have calculated for our Fig. 4. We have added discussion in the manuscript.