

Interactive comment on “The role of organic aerosols in homogeneous ice formation” by B. Kärcher and T. Koop

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We are grateful to Dan Murphy for running similar cases using a different numerical model. Apart from several technical details, his model differs from ours in assuming a more realistic temperature evolution (variability in cooling rates rather than constant cooling rates). We have refrained from doing so and have used idealized dynamical forcing to work out as clearly as possible the main processes at work.

We are happy that those results generally agree with ours, in particular (i) the control of cloud properties by particle hygroscopicity and associated particle size effects on freezing and (ii) the weak impact of changes in the water accommodation coefficient on cloud formation unless these changes are rather large.

We believe that this independent analysis strongly increases confidence in the more general findings and conclusions of our work concerning the role of organic aerosols

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in cirrus formation. We agree that we might not be able to explain all of the possible effects that can occur during homogeneous freezing of complex aerosol mixtures with our two-mode approach (see our reply to comment by Dan Cziczo) and because of pending uncertainties in alternative freezing mechanisms mentioned in our discussion paper (page 6735f, lines 23ff).

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 6719, 2004.

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