

## ***Interactive comment on “Laboratory evidence for volume-dominated nucleation of ice in supercooled water microdroplets” by D. Duft and T. Leisner***

### **Anonymous Referee #1**

Received and published: 10 July 2004

#### General Comments:

This manuscript addresses an important topic, surface nucleation of aerosol particles. Recently it has been suggested that surface-initiated homogeneous nucleation may be important in the atmosphere.(1,2) More recently Kay et al.(3) concluded that ice embryo formation at the surface cannot be confirmed or disregarded. This manuscript, by Duft and Leisner, report nucleation rates in supercooled water microdroplets as a function of particle size to help resolve this issue.

Duft and Leisner conclude that homogeneous freezing is a volume-proportional process for particles between 19-49 microns, and they suggest that surface nucleation might only be important if at all for much smaller droplets. This is a noteworthy contri-

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper

tribution as it at least constrains the range over which surface nucleation may be important.

#### Specific Comments:

The authors should clearly state that the particle sizes relevant for freezing in the atmosphere are typically sub-micron to a few microns at most, which is outside the range of this study. The authors do imply this in the second paragraph of the Discussion, but I think it needs to be stated more clearly.

(1) Djikaev, Y. S.; Tabazadeh, A.; Hamill, P.; Reiss, H. *Journal of Physical Chemistry A* 2002, 106, 10247. (2) Tabazadeh, A.; Djikaev, Y. S.; Reiss, H. *Proceedings of the National Academy of Sciences of the United States of America* 2002, 99, 15873. (3) Kay, J. E.; Tsemekhman, V.; Larson, B.; Baker, M.; Swanson, B. *Atmospheric Chemistry and Physics* 2003, 3, 1439.

---

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 4, 3077, 2004.

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper