

Interactive comment on “Surface features on Sahara soil dust particles made visible by atomic force microscope (AFM) phase images” by G. Helas and M. O. Andreae

Anonymous Referee #2

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This paper describes the results of AFM scans on some mineral dust particles. Using phase information from intermittent-contact images, it is shown that the surfaces of dust particles are inhomogeneous, probably due to deposits of another material on the mineral surface. In some cases these deposits partially fill the grooves in the surfaces of dust particles, in other cases they almost fully cover the area that can be scanned with the AFM.

The main point of the paper is that surface features on aerosol particles can be visualized and their dimensions measured using phase information from AFM. Since this is the first study that used AFM phase imaging for atmospheric aerosol (not counting

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some conference abstracts), the paper is worth publishing in AMT. The ms is well written and the interpretations of images are probably correct. As the authors themselves mention, the information gained from the AFM scans is limited by the lack of compositional data and the small vertical and lateral scanning ranges of the piezo scanner, resulting in speculative conclusions about the nature of the observed coating on the particles. It remains to be seen whether this technique, phase imaging with AFM, will gain some significance in aerosol science.

Minor comments:

In the first two paragraphs of the Introduction a general reference on AFM should be cited.

"an image can be formed in a similar way as is done for terrain mapping using remote sensing techniques from satellites.." This comparison may be confusing, since satellites do not change their altitude with surface topography.

"Unfortunately, the transmission electron microscopic procedures also result in the destruction of the particles. TEM a destructive method" This is a gross exaggeration. Many types of atmospheric aerosol particles can be studied with TEM without any damage to them, only the most volatile species are destroyed.

Samples were collected in 1992 – how were they stored? Is there any possibility that the surface deposits formed during storage?

"The EFM signal varies accordingly, but obviously is much less sensitive." Why is it obvious that it is less sensitive?

Interactive comment on Atmos. Meas. Tech. Discuss., 1, 1, 2008.

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