

***Interactive comment on “On realistic size equivalence and shape of spheroidal Saharan mineral dust particles applied in solar and thermal radiative transfer calculations” by S. Otto et al.***

**Anonymous Referee #1**

Received and published: 6 January 2011

This is a thorough and instructive theoretical study of the effects of nonsphericity of dust aerosols on their integral radiative properties. This study is original and useful and deserves publication after a minor revision.

1. Page 29198, line 20. This sounds like the authors have developed their own versions of the NF and GOA methods. If so, they should provide a few details to make the paper more self-contained. If not, references to original papers should be given.
2. Laboratory measurements by Volten and Munoz (several JGR, JQSRT, and Astron. Astrophys. papers) give us a pretty good idea of how the phase functions for natural dust particles should look like. It would be instructive to see plots of the theoretical

C12077

phase functions in order to conclude whether the modeling results reported in this paper are plausible.

3. The authors focus on the integral radiative properties, whereas Mishchenko et al. (GRL, 1995) and Dubovik et al. (JGR, 2006) claim that nonsphericity has a much stronger effect on remote sensing via profound modifications of the elements of the scattering matrix. The authors should comment on the remote-sensing implications of their modeling of the optical properties of nonspherical dust particles.

---

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 29191, 2010.