

Interactive comment on “Alignment of atmospheric mineral dust due to electric field” by Z. Ulanowski et al.

Z. Ulanowski et al.

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We are grateful for both insightful comments. Concerning possible polarization contribution from scattered moonlight, we are satisfied that it is very unlikely to be significant, for several reasons:

1. As we already point out, the polarimeter aperture is very small (5 arc seconds in diameter).
2. The Moon was below the horizon during the dust episode - it did not rise till 6 UTC or later.
3. The polarized signal from background sky is measured directly in a second "sky channel" and subtracted if necessary; in any case, the measured sky signal was negligible on May 3 - May 7.

**Interactive
Comment**

The second comment relates to possible existence of a horizontal component of the electric field due to the surface topography of the mountain site (caldera). The horizontal field component could in principle lead to a horizontal component of alignment, that would manifest itself as an azimuthal dependence of excess polarization, most notably the position angle. The position angles (Θ -V) given in Table 3 of the companion article (Bailey et al., MNRAS, submitted) show rather more scatter than would be expected from random errors about the 90 degree value (for horizontal polarization). So this could indicate that the electric field is not always vertical. Unfortunately, our data is too sparse to indicate any trends and to allow us to evaluate this hypothesis fully.

Furthermore, we do not know at this stage if the electric field is produced due to the presence of a dipole within the dust layer, or due to unipolar charging. Only in the latter case would surface topography strongly influence the field, as the potential difference would be present essentially between the layer and the ground. So, unfortunately, in the absence of in situ measurements of electric properties on the one hand and more extensive polarimetric observations on the other hand, any discussion of this topic would be purely speculative. However, future observations can address this interesting possibility.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 13203, 2007.

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