Atmos. Meas. Tech. Discuss., 5, C2077–C2079, 2012
www.atmos-meas-tech-discuss.net/5/C2077/2012/

Atmospheric Measurement Techniques Discussions

Interactive comment on "Comparison of satellite microwave backscattering (ASCAT) and visible/near-infrared reflectances (PARASOL) for the estimation of aeolian aerodynamic roughness length in arid and semi-arid regions" *by* C. Prigent et al.

C. Prigent et al.

catherine.prigent@obspm.fr

Received and published: 5 September 2012

The paper compares the potential of two approaches to estimate the Aeolian aerodynamic roughness length from two different types of sensors (visible/near infrared observations and microwave backscattering measurements) and proposes to merge the two sources of information to benefit from their complementary aspects. The use

of improved estimates of aeolian roughness lengths is a need in the dust modeling community. This work is a good contribution towards this end. It is concise and well written and deserves publication in AMTD.

>Thank you to the reviewer for his/her support and encouragements.

I have a few comments:

- The final PARASOL-ASCAT Z0 map at 6 km resolution is very similar to the ASCAT map. Also, the correlation of the Z0 derived from ASCAT and the in-situ measurements is equal to the correlation of the merged product (PARASOL-ASCAT) and the in-situ measurements. My main concern is whether the higher resolution of the PARASOL is really contributing to a better product and how different would be a 6km map of ASCAT (just interpolating the 25 km grid to a 6 km grid) to the merged 6 km PARASOL-ASCAT. Is the merging of the 2 products really justified? How important is the variability at 6 km resolution within a 25 km resolution grid cell? This could be easily calculated and explored. I suggest that the authors introduce this analysis.

>In heterogeneous regions, the spatial resolution of the PARASOL instrument can help delineate the finer spatial structures. For the North African region where z0 calculations are valid (i.e. where z0 is below 0.1 cm), the mean Parasol k1/k0 is 0.04, with a mean standard deviation of 0.01 of the 6 km pixels over a 25 km pixel. This is a significant spatial variability of $\frac{1}{4}$ of the mean value. In heterogeneous areas, the standard deviation can get as high as 100% of the mean value. We agree that in the estimation of z0, the scatterometer information plays a key role. Nevertheless, the Parasol information does add some small scale variability in the z0 estimation that can benefit the modelling activities at high resolution. The reviewer is right, depending on the application, the ASCAT only data set can be preferred, as it can also provide a seasonal variability that Parasol cannot offer because of atmospheric contamination part of the year. Comments have been added in section 3.3.

- Pages 2941 and 2942: correlations of 0.75 and 0.85 do not mean 75% and 85% of the

AMTD

5, C2077–C2079, 2012

variance explained. It is the square of the correlation that is interpreted as a measure of the variance explained. In this case it would be 56.25 % and 72.25 %, respectively.

>The reviewer is right. The numbers indicated on p. 2941 for the explained variance were wrong. The correlations of 0.75 and 0.85 explain respectively 56 and 72% of the variances. The text has been changed accordingly.

Minor issues:

- Page 2936, line 20: a “the” is repeated twice in the sentence: : :

>Corrected.

- Page 2941, line 10: “ The winters of 2007 and 2008: : :”

>It is actually the winter 2007-2008 in the Northern hemisphere.

- Page 2944, line 5: Taklamakan

>Corrected

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 2933, 2012.