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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Characterization of dust aerosols in the infrared from IASI and comparison with PARASOL, MODIS, MISR, CALIOP, and AERONET observations" *by* S. Peyridieu et al.

Anonymous Referee #1

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General comments

An informative and well-written analysis of IASI dust retrievals over ocean is presented, compared with observations from ground-based AERONET stations and four other satellite instruments. As well as measurements of the aerosol optical depth, of particular interest are the capabilities of the IASI instrument at retrieving dust altitude and dust effective radius. Compared against satellite lidar measurements from CALIOP, IASI seems to perform well at retrieving the dust altitude, useful information for the dust observations community. I recommend publication subject to minor revisions.

Specific comments

Page 23095, line 2: should be '+0.35 μm'

Page 23095, line 24: some previous work has been carried on remote sensing of aerosols and dust in the IR, e.g. Klüser et al. (2011), Klüser et al. (2012), Brindley & Russell (2009), and Banks & Brindley (2013). These studies have looked at dust loading over land, using the IASI and SEVIRI instruments.

Page 23101, line 4: 'Only night-time observations are analysed'- could the authors comment please on any day-time/night-time bias that we might thus expect to see, and whether or not this would be significant over the ocean?

Page 23103, line 6: in the AS region where is the predominant source of the dust? Arabia or South Asia?

Page 23105, line 17: the region which the AERONET sites are assumed to be representative for is +/-3 degrees in both longitude and latitude. This seems to be quite a large area, please comment on this choice of range from the AERONET site.

Page 23106, line 1: the authors comment on the difference in the AOD peak months between IASI/MISR/AERONET and MODIS/PARASOL. Do they have any suggestions as to why this may be?

Page 23106, line 8: might we expect the Karachi site to be contaminated by significant amounts of urban and industrial pollution? The same may also be true of Dakar.

Page 23109, line 1: beyond the systematic bias of 0.35 microns, what is the significance of the results shown in Figure 11? Please elaborate further.

Page 23110, line 6: it would be worthwhile to make a quantitative statement on the AODs in this paragraph.

Page 23111, line 9: is this westward decrease consistent with what we might expect of the aerosol altitude from the behaviour of the Saharan Air Layer?

Page 23112, line 12: 'increasing IASI performance twofold'- by which metric?

Page 23127, Figure 7: AERONET and MODIS have very similar colours, more differentiation would make the plot much easier to read, especially since AERONET is being used as the reference.

Page 23129, Figure 9a: visual comparisons between regions may be hindered by the inconsistent altitude scale between panels. I would recommend setting a consistent altitude scale ranging from 0.5 to 3.5 km.

References

Banks & Brindley, Remote Sensing of Environment, 128, 58-73, 2013.

Brindley & Russell, Journal of Geophysical Research, 114, D23201, 2009.

Klüser et al., Atmospheric Measurement Techniques, 4, 757-773, 2011.

Klüser et al., Atmospheric Environment, 54, 419-427, 2012.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 23093, 2012.