

Response to anonymous RC#2

The work by Levy et al. “Exploring systematic offsets between aerosol products from the two MODIS sensors” shows the efforts of the authors to understand and correct the offsets between MOD04 and MYD04 products. The BIAS was not completely eliminated but important improvements have been achieved over land (from 0.02 → 0.01), once applying a series of correction regarding cross-calibration, de-trending etc.

Another important success of their work was to justify that the offsets between the two sensors are not linked to real aerosol cycles which is of a great importance to avoid misunderstandings in future worldwide studies.

Therefore, I recommend the paper for publication. Even if the authors partially failed in the total understanding of the offsets, the tests that discard possible proveniences of the errors and the overall conclusions from the work will be useful for the aerosol community.

We thank Reviewer #2 for their careful reading of this paper. Our responses to the detailed comments are in red.

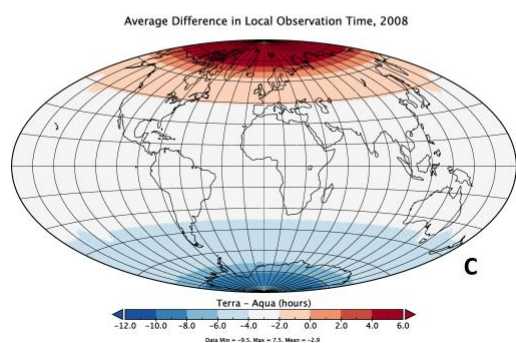
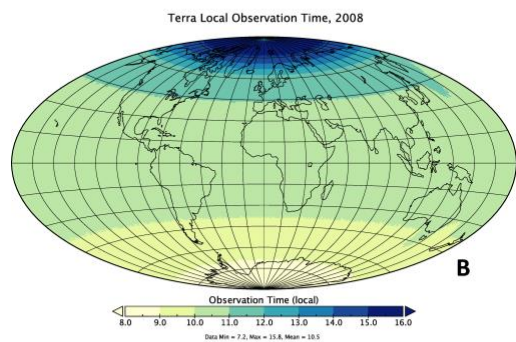
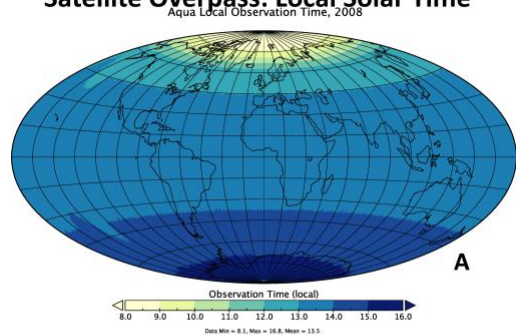
Major remarks.

The way that orbits are designed, crossing the equator at 10.30AM and 13.30PM both equidistant to 12.00PM, makes me think that the scattering ranges and the observation geometry are the same in both sensors (basic information used as input in LUT algorithms). I would like to have a confirmation of this fact from the authors, since otherwise this fact could represent a source of differences (I guess that the distribution of scattering ranges is just symmetrical north hemisphere / south hemisphere and same conditions in the equator).

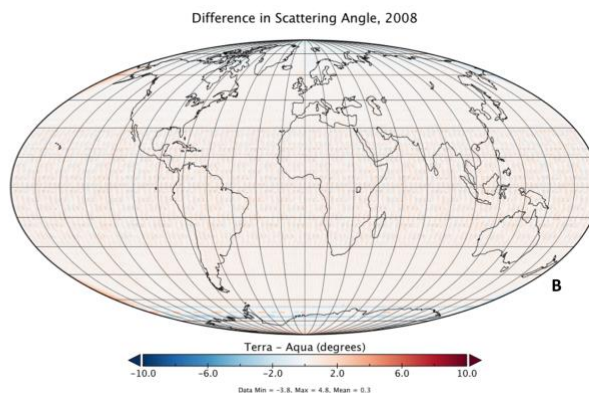
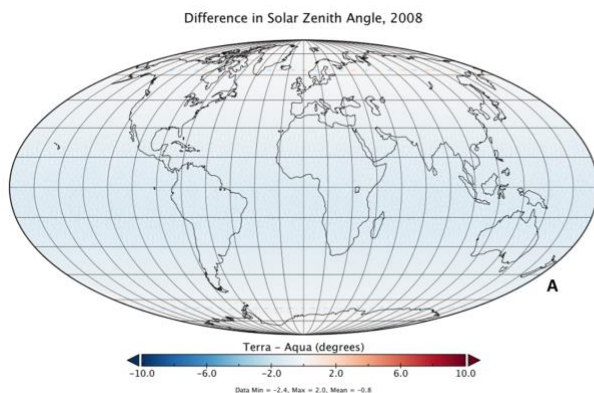
This is a really interesting comment, and one we debated on whether to put it in the paper. We have created some plots regarding the differences in Local Time observed by the two MODIS sensors (As new Figures within the paper), as well as plots showing relative differences of geometry (shown here only).

For the geometry, when looking at 2008 only, there is on average a 0.8° difference in solar zenith angle (Terra < Aqua), and associated difference of 0.3° in scattering angle (Terra > Aqua). Of course, this is in the annual average; the geometry becomes less symmetrical on shorter time scales.

Satellite Overpass: Local Solar Time



NEW Figure 1: Gridded average MODIS local observation time (local solar time) for Aqua (A), Terra (B) and the difference between the two (C).



Extra Figure (not in paper): Gridded average solar zenith (A) and scattering angles (B) for 2008. Each panel represents the difference between averaged MOD04 and averaged MYD04 (Terra-Aqua).

Minor remarks.

Page 2-3 - Introduction: somehow the order of the paragraphs is not completely logic to me. I would suggest to exchange them. If we numerated them from 1 to 5. A more logical order may be 1-3-4-2-5.

We agree. We have swapped paragraphs as suggested.

Page 4. Line 26. There is a paragraph starting with "Finally" when actually the subsection 2.1 continues for another 3 pages. I don't know if there was another subsection starting in the beginning of page 5 and at some point was eliminated.

We have removed the "Finally"

Page 10 Lines 25-29 and Page 11 Lines 16-18. A similar concept is repeated in these two paragraphs.

Yes, this is true. The difference is that one section refers to sampling the model to include the entire MODIS swath, and the next deals with sampling the model only where aerosol was retrieved.

Section 5. Sometimes it is written C61 instead of C6.1, please check this out.

We have changed all instances of C61 to C6.1. Thank you.