We really appreciate Dr. Michael Garay for his thorough review, constructive suggestions, and inspiring comments. We truly believe the quality of the paper will reach a new level by integrating comments from all the reviews.

This paper examines the performance of three satellite aerosol optical depth (AOD) retrieval algorithms over land: MODIS dark target (DT), MODIS Deep Blue (DB), and MISR. The authors begin with comparisons against ground-based AERONET sunphotometer measurements for eight selected sites. Next, the authors examine how each of the MODIS algorithms compares with MISR spatially by looking at ratios, differences, regressions, and gradients. In addition, the authors provide supplementary material that provides more detailed, seasonal breakdowns of their analyses in the form of a single KML file suitable for use with Google Earth. I found this to be a very interesting paper, appropriate for the journal, and this type of analysis is extremely important for both developers of satellite aerosol retrieval algorithms as well as the aerosol community as a whole. That said, I believe the paper would benefit in a number of places from a more detailed discussion of the underlying ideas upon which the authors base their conclusions. A few additional references would help place this work into a larger context and direct readers to the more extensive literature on this subject. MISR and MODIS AOD retrievals have been compared in the past, but the authors present their analysis in a novel way and include MODIS DB, which has only recently become available for the Terra satellite platform. The paper is well organized and well written, for the most part, with a few minor linguistic lapses. Although the abstract suggests that the supplementary material contains GeoTIFF files, I only found a single KML file, as mentioned above. Finally, it's not clear to me that this work actually addresses the question raised in the title, as to where we need additional in situ aerosol and sun photometer data. The second part of the title may be a more appropriate for this paper.
I have provided specific comments and technical corrections below, and I'm happy to engage in further discussion with the authors, as appropriate. I believe this is important research and some relatively minor changes will result in a significantly stronger manuscript and a substantial contribution to the community.

We thank Dr. Garay for his kind comments. We agree that the title of the paper needs to be modified to be more pertinent to the content of the paper. We have renamed our paper "A critical examination of spatial biases between MODIS and MISR aerosol products—application for potential AERONET deployment".

Page 4311, we have changed "These are provided in GeoTIFF and KML format." to "These are provided in KML format."

Comment: *Page 4297, Line 5: It's not clear that the question raised here, "is the distribution of AERONET sites sufficient to cover the spatial and temporal variations of the aerosol state globally?" is actually answered in this paper. It seems to me like that might be an appropriate topic for another paper, but I don't think it's addressed here.*

Answer: Agreed. We have deleted this sentence.

Comment: *Page 4297, Line 13: It seems like you want a reference to go along with the comment "land features and particle properties have spatial coherence: : :" Perhaps Anderson et al. (2003) would be appropriate.*

Answer: Done. We have added "Anderson et al. (2003)" at the end of the sentence. Thank you for the suggestion.

Comment: *Page 4297, Line 14: I don't see how the conclusion, "we would expect satellite retrievals of aerosol products to share similar patterns in their biases" follows logically. This might be more correct if "in their biases" was removed. If I compare two "perfect" retrievals, then there would be no pattern to the biases, right?*

Answer: We have modified the sentence to avoid confusion. "As land features and particle properties have spatial coherence, we would expect **some** satellite retrievals of aerosol products to share similar patterns in their biases **with respect to such a spatial coherence**".

Comment: *Page 4297, Line 6: I think it's probably important to mention that this "reported uncertainty" is the 1- σ uncertainty because otherwise it's unclear what these ranges mean. See Kahn et al. (2011) for a detailed discussion of this point.*

Answer: Agreed. We have changed "uncertainty" to "one standard deviation of uncertainty"

Comment: *Page 4297, Line 23: Where are the collection 5.1 MODIS DB AOD uncertainties for Terra reported in the literature? I'm not aware of any extensive validation of this particular product.*

Answer: You are right. We have added "AQUA" before "DB"

Comment: *Page 4300, Line 1: I don't understand the comment about retrievals over snow and ice. Kahn et al. (2010) doesn't evaluate the performance of the MISR product over snow and ice (there's only a generic comment in the paper). Does MODIS DB perform (accurate) retrievals over snow and ice, making it important to highlight this difference?*

Answer: Agreed. We have deleted a few words accordingly: "though not over snow and ice"

Comment: *Page 4300, Line 2: Once again, it's probably important to mention that these are 1-_ uncertainties (i.e., approximately 68% of the retrievals are expected to fall within the reported error envelopes).*

Answer: We have changed "uncertainty in" to "one standard deviation of uncertainty in"

Comment: *Page 4300, Line 14: Why is the qualification "near" needed? Although the MISR observations occur over a period of seven minutes centered on the nadir-look which is simultaneous with MODIS, the MISR retrieval assumes that the aerosol is unchanging over this _3.5 minutes.*

Answer: Agreed. We have deleted the qualification “near”.

Comment: *Page 4300, Line 18: I believe there’s a slight overlap of the MODIS swaths near the poles, so gridding over six hours will potentially combine data from different orbits. This doesn’t affect the analysis here because this will only occur at the swath edges (i.e., MISR does not overlap).*

Answer: Thank you very much for your suggestion. We have reworded the sentence to : “Note that the MODIS swaths overlap near the poles, so gridding over six hours will potentially combine data from different orbits. However, this doesn’t affect the analysis presented in this paper because such overlaps will only occur at the swath edges for MODIS and MISR swaths do not overlap.”

Comment: *Page 4301, Lines 10-11: You claim that the records “provide representative observations [of] the aerosol state. . .” How do you know these are “representative”? I can’t speak to all of the sites, but Maricopa, AZ (in the Sonoran desert) is certainly not representative of Boulder, CO (in the Rocky Mountains), or Fresno, CA (in the San Joaquin Valley), but all these sites are in the Western US. The differences among the sites in India (e.g., Kanpur and Vishakapatnam) are also dramatic.*

Answer: Agreed. We have deleted “*representative”*.

Comment: *Page 4301, Line 17: To calculate the AOD from the AERONET observations at the MISR and MODIS wavelengths, was a linear fit in linear (AOD, wavelength) space used, or a linear fit in log-log space? The Shi et al. (2011) paper referenced here mentions the O’Neill approach (i.e., log-log), but it should be made clear. Also, what was done for Banizoumbou, which doesn’t appear to have a 500 nm band?*

Answer: Thanks for your suggestion. We have changed from “(linear) fit ” to “linear fit in log-log space”. As for the Banizoumbou site, we have added “or 0.44” after “0.5”.

Comment: Page 4301, Line 19: Does a “30 min temporal window” mean ±30 minutes or ±15minutes?

Answer: We have changed “30 min” to “±30 min”

Comment: *Page 4301, Line 20: Since the satellite data were aggregated into 0.5_ grids, how can you guarantee that an AERONET site is going to be within 0.1_ of what I assume is the center of a grid cell? I think what you’re probably doing is finding the nearest 0.5_ grid center to the AERONET location.*

Answer: For Satellite and AERONET AOD comparisons, we used the level 2 satellite products (e.g. 10 km resolution for MODIS). To avoid confusion, we have added “(level 2)” after “MODIS/MISR”.

Comment: *Page 4301, Line 22: It's hard to make sense of Table 1 without knowing how many points (N) were included in the statistics. It would also help to include N for the full range of AOD and the range less than 0.5. Also, there's clearly something amiss comparing Fig. 1 to the intercept values in Table 1. Take Shirahama, for example. The plot shows the black line intersecting the x-axis at a value greater than zero. This means that the y-intercept must be less than zero, but it's given as 0.05 in Table 1. I was initially struck by the fact that all the intercept values are positive, but this doesn't appear to actually be the case for MODIS DT at Alta Floresta, Shirahama, Banizoumbou, GSFC, or Maricopa. It's harder to tell what's happening for the other cases just from the plots.*

Answer: We have added the number of points for the full range of AOD and for the AOD range less than 0.5. Also, we have corrected the intercept values.

Comment: *Page 4301, Line 27: What does "reasonable correlations with the collocated AERONET data" mean? Since you've gone to the trouble to be quantitative in Table 1, why not be specific about this? For example, I don't think an R2 value of 0.35 for MODIS DB at Solar Village is "reasonable" at all. Maybe I think an R2 threshold of 0.5 is "reasonable," then I find that 75% of the comparisons between the MODIS, MISR, and AERONET AODs are "reasonable." 81% of the MISR, 79% of the MODIS DT, and 60% of the MODIS DB comparisons are below this (arbitrary) threshold. The breakdown of how the correlations behave for the full range of AOD and the range less than 0.5 is also interesting. In particular, MODIS DB shows less "reasonableness" when restricted to low AOD, but the sample size is very small.*

Answer: Point is taken. We have modified the sentence to "… reasonable correlations with the collocated AERONET data. For example, other than the Maricopa and Solar Village sites, r^2 values of above 0.6 are found between the MODIS (DT and DB), MISR, and AERONET AODs."

Comment: *Page 4302, Lines 1-2: It might help to be more explicit in this sentence. Which specific sites are dominated by which aerosol species? It's also not clear to me why slope differences indicate microphysical property issues. A thought might be to make the plots in Fig. 1 in log(AOD) space, rather than linear AOD space. In general, AOD values are low, and plotting things in linear space makes a blob at small AODs and draws your eye to the outliers at high AOD. (Linear) regression lines behave in the same way. They tend to emphasize the outliers at high AOD because these few retrievals act as strong "levers" on the overall quality of the fit.*

Answer: Points are taken. We have rewritten the sentence as "Yet slope differences are clearly noticeable for areas dominated by different aerosol species (e.g., dominant dust aerosol particles over Kanpur and biomass burning aerosol particles over Mongu), indicating that aerosol microphysical properties are among the sources of uncertainties in these aerosol products."

Comment: *Page 4302, Line 11: You mention that Maricopa doesn't have enough MODIS DT data points to plot the slope. What was the criterion for this cutoff? Also, even though you don't provide the slope in the Figure, the value still appears in Table 1. Is that consistent?*

Answer: First of all, we have added the number of points in the table 1. The total number of points for *MODIS DT* data over the Maricopa site is 25. We didn't include the slope of the MODIS DT data for the site not only because the number of data points is limited, but also because the data are rather scattered, and a linear regression is less representative with a dataset that experiences a scattered and non-linear pattern (e.g., the slope is 0.99 from the linear regression with a large intercept value of 0.25).

We have modified the sentence from "Note that the black regression line for MODIS is not provided from the Maricopa plot due to an insufficient number of data points." to "Note that the black regression line for MODIS is not provided from the Maricopa plot due to an insufficient number of data points as well as a scattered and non-linear pattern of the data distribution that makes a linear regression less representative. We have also removed the corresponding slope value from Table 1.

Comment: *Page 4302, Line 13: I don't understand the comment about large intercept values at Kampur and Mongu for MODIS DB. Table 1 gives the intercepts as 0.04 and 0.17, respectively. The second one is large, but the first is not. See comment above about the intercept values reported in the table, which are clearly incorrect. I guess I follow the argument that when the AOD is low, then the "uncertainty" is driven by the surface. If the y-intercept is negative, then the surface albedo must be overestimated (like at Mongu for the MODIS DB algorithm). Conversely, if the y-intercept is positive, then the surface albedo must be underestimated (like at Banizoumbou and Solar Village for MODIS DB).*

Answer: We have changed from "AERONET AOD values at the Kanpur and Mongu sites" to "AERONET AOD values at the Mongu site"

Comment: *Page 4302, Line 16: The ability to retrieve AOD over bright surfaces with MISR is well known (e.g., Diner et al., 2001; Martonchik et al., 2004). Since MODIS DB was designed to retrieve aerosols over bright surfaces, it might be worthwhile citing Hsu et al. (2006) again.*

Answer: We have added the references after "over bright surfaces" (e.g., Diner et al., 2001; Martonchik et al., 2004; Hsu et al., 2006)

Comment: *Page 4302, Line 19-20: How do spatial comparisons between MISR and MODIS relate to point comparisons between MISR and AERONET and MODIS and AERONET? They seem like two entirely different things. To make the argument that larger scale comparisons are required, I think you'd probably want to regress MISR and MODIS against one another at the AERONET sites to see how large the differences are. See Kahn et al. (2011) for a discussion of how such a comparison should be done.*

Answer: Thanks for your great suggestion. We have no intent to relate spatial comparisons between MISR and MODIS to point comparisons between MISR and AERONET and MODIS and AERONET. Here we simply want to point out that sparse point comparisons may not be representative of the performance of a product over a region. For example, large spatial variations are found from Figure 3 for the ratio of MODIS and MISR AOD values, but point measurements from AERONET could only represent a fraction of such a variance. To avoid the

confusion, we have added the following sentence: “Here we simply want to point out that sparse point comparisons may not be representative of the performance of a product over a region. “

In fact the suggested study has been reported by the author during the 2009 AGU meeting [Shi et al., 2009]. However, to fully explore this issue requires another manuscript that is beyond the scope of this paper.

Comment: *Page 4302, Line 27: “these” refer to the regressions in Fig. 1 and Table 1. Do you actually have a mechanism for answering this question? I think to answer this, you want to compare satellite/AERONET regressions for AERONET sites in close geographical proximity, rather than making maps of the instrument to instrument regressions against one another.*

Answer: “These” refers to the regressions reported by Hyer et al., [2011] (mentioned in the previous sentence). The purpose of this paper is to point out spatial differences among satellite products and the potential locations for future AERONET sites. We have no plan to answer this question in this paper as it is a topic of another manuscript.

Comment: *Page 4303, Line 10: When referring to the climatology, I think it’s fine to mention particle type (e.g., “heavy smoke aerosol plumes”). However, since this study deals only with AOD, be careful not to attribute particle type to the satellite retrievals. So, rather than writing “dust plumes are visible over North Africa: : :” you could either write “dust plumes are common over North Africa: : :” (referring to the climatology) or “regions of high AOD likely associated with dust plumes are visible over North Africa: : :” (referring to the retrievals.*

Answer: Agreed. We have changed “dust plumes are visible over North Africa” to “Regions of high AOD that are likely associated with heavy smoke aerosol plumes are seen over South America, South Africa, and Indonesia, with dust plumes are visible over North Africa and the Middle East”

Comment: *Page 4303, Lines 21-22: You’ve been incredibly generous by referring to the observed differences as “uncertainties.” Here, I think “differences in the retrieval processes” is appropriate, however.*

Answer: Done. We have changed: “uncertainties in the retrieval processes” to “differences in the retrieval processes”

Comment: *Page 4303, Line 25: These results for the Western US agree with the results reported in van Donkelaar et al. (2006; 2010).*

Answer: We have added “These results for the Western US agree with the results reported in van Donkelaar et al. (2006; 2010).” after “Fig. 2a.”

Comment: *Page 4304, Line 8: The sentence should more appropriately read, “… underestimates the biomass burning AOD compared to AERONET.”*

Answer: Done. We have changed "…underestimates the biomass burning aerosol" to "…underestimates the biomass burning AOD compared to AERONET."

Comment: *Page 4304, Lines 9-10: The figure labels in Fig. 2 are confusing. Typically the top row is (a) and (b), then the bottom row is (c) and (d). Here the top row is (a) and (c). This also leads to some confusion in the body of the text. Also, why are there any retrievals plotted over the ocean? Neither MISR nor MODIS retrieves aerosols over the ocean using their respective land algorithms. This should be corrected in the figure.*

Answer: Figure label has been changed as suggested. To generate the plots, we used available MODIS and MISR level 2 aerosol products. For the MODIS DT and MISR comparisons, since over land and ocean data are available from both products, an analysis that include both land and ocean satellite data are reported. As for the MODIS DB and MISR comparisons, since only over land MODIS DB data are available, only over land comparisons are performed.

Comment: *Page 4304, Lines 18-19: What does "consistent to a reasonable degree" mean?*

Answer: We have changed "Over desert regions such as North Africa and the Middle East, the AOD values from the two products are consistent to a reasonable degree" to "Over desert regions such as North Africa and the Middle East, the AOD values from the two products have differences around 0.1 to 0.3.

Comment: *Page 4304, Line 20: In the previous plots the (small) wavelength difference between MODIS and MISR has been ignored (550.0 nm for MODIS and 557.5 nm for MISR). When taking the ratios of the AODs, as in Fig. 3, however, this adds an additional (small) factor that depends on the Angstrom exponent of the aerosol. Using the equation for the Angstrom exponent, it can be shown that the ratio of MODIS to MISR AOD is bounded by 1.04 (for an Angstrom exponent of 3) and 0.96 (for an Angstrom exponent of -3). The ratios discussed in the text as being significant lie well outside these bounds, though. Not accounting for the wavelength difference also leads to (small) differences in the AODs themselves, of course.*

Answer: Agreed. We have added "There is a small wavelength difference between MODIS and MISR channels around 550nm *(550.0 nm for MODIS and 557.5 nm for MISR).* Not accounting for the wavelength difference also leads to (small) differences in the AODs themselves" after "…MISR AOD."

Comment: *Page 4305, Lines 15-17: I believe the argument here only applies to locations where the AOD ratio is greater than one.*

Answer: We have changed "in part" to "in locations where the AOD ratios are greater than one"

Comment: *Page 4305, Line 20: Where do you think the multiple scattering regime is reached?*

Answer: As suggested by Hyer et al., [2011] as well as by Zhang et al., [2007], multiple scattering becomes visible when AOD > 0.2, and important for AOD>0.5. To avoid misunderstanding, we have rewritten the sentence as "Furthermore, uncertainties in the

microphysical models used in these retrievals are amplified at higher aerosol loading regions due to multiple scattering [Zhang et al., 2007; Hyer et al., 2011]."

Comment: *Page 4306, Line 3: I think the point could be expressed more clearly. Regions with large intercept values indicate locations where the MODIS DT assumed surface reflectance is too low, typically in arid and semi-arid regions with high surface reflectance. This was also pointed out and discussed in some detail in Kahn et al. (2010).*

Answer: Thanks for your suggestion. We have changed "Regions with high intercept values are most likely attributed to surface characteristics, because all of these regions are semi-arid and have relatively high surface reflectance" to "Regions with large intercept values indicate locations where surface reflectance values may be underestimated for the MODIS DT retrievals, typically in arid and semi-arid regions with high surface reflectance (Kahn et al., 2010)."

Comment: *Page 4306, Lines 13-20: While I agree with the sentiment in this section, what's missing is a discussion of the temporal aspect of the problem. How long does it take to build up a statistically useful database once a new AERONET site comes online? Let's say, at best, you get two satellite observations per month of the new site (limited by the orbit, clouds, etc.). That means six observations per season per year. While this is certainly better than nothing, you probably need at least two years of continuous AERONET observations to get something useful. More important, however, is the particle information, which is less frequently available, requiring a longer time record.*

Answer: Point is taken. We have added a sentence to address this "4. Note that build up a statistically useful database for new AERONET sites may take time, but such efforts are potentially beneficial to not only current but most importantly to future sensors."

Comment: *Page 4307, Lines 15-16: I'm not sure that the Yellow Sea should be included in a comparison of land retrieval algorithms.*

Answer: As mentioned before, the spatial analysis includes both land and ocean retrievals if available.

Comment: Page 4307, Line 22: What does "relatively large" mean with regard to the AOD differences?

Answer: We have added "(AOD > 0.1)" in the text to clarify this.

Comment: *Page 4309, Line 21: Why use a longer data record with different spatial gridding for the AERONET data?*

Answer: To our knowledge, the frequency distribution of AERONET observations has not been reported. The purposes of using a longer data record are not only because we could provide such a frequency distribution, but also because this study highlights regions that have not yet been considered for AERONET deployments since 1993. Also, because AERONET data are rather sparse, half degree or one degree averaging makes minor, or in most regions, no difference.

Comment: *Page 4311, Lines 11-12: I don't know that you can conclude that "most of the issues with satellite retrievals. . . relate to surface reflectance characterization" based on this analysis. It could be that BOTH surface reflectance and particle properties are problematic. For example, it's been shown that transported non-spherical aerosol causes problems with the MODIS AOD retrievals in the Western US (Liu et al., 2007).*

Answer: Agreed. We added the following discussions: "Yet it may also be partially due to inaccurate representations of particle properties, especially non-spherical aerosol particles (Liu et al., 2007)."

Comment: *Page 4311, Lines 18-20: This sentence might be overstating the case. I would agree that regional measurements may be useful, particularly when made over poorly observed regions. Whether and how these measurements are incorporated into global algorithm development determines whether they have "significant value."*

Answer: We have modified the sentence to "Regional measurements of aerosol or lower boundary condition properties, even over short field studies, could have significant value when measurements are made in poorly observed regions."

Comment: *Page 4311, Lines 22-24: I only found a single KML file in the supplement, and no Geo-TIFFs. In addition, it might be helpful to point out some examples of these "hotspots" to look at in Google Earth.*

Answer: Page 4311, we have changed "These are provided in GeoTIFF and KML format." to "These are provided in KML format."

Technical Corrections

Thank you very much for the comments. We have made the technical corrections as suggested.

Page 4295, Affiliation 1: "Grand Folks, ND" changed to "Grand Forks, ND"
Page 4295, Affiliation 3: "Greenbelt" is a single word. Done.
Page 4297, Lines 10-11: "Typically, retrievals" changed to "Retrievals"
Page 4297, Line 20: "conditionS" changed to "conditions"
Page 4299, Line 5: "fine mode to total AOD fraction over water" changed to "fine mode AOD fraction over water"
Page 4299, Line 9: "Zhang et al., 2006" changed to "Zhang and Reid, 2006"
Page 4299, Line 11: "low boundary conditions" changed to "lower boundary conditions"
Page 4299, Line 27: "~360 km" changed to "~380 km (Diner et al., 2002),"
Page 4301, Line 4: "aerosol optical depth" changed to "AOD"
Page 4301, Line 5: deleted "of different products"

Page 4301, Line 8: “results” changed to “comparisons”
Page 4301, Line 15: “with the uncertainties” changed to “with uncertainties”
Page 4301, Lines 26-27: “MODIS DT (MODIS DB) and MISR” changed to “MODIS DT, MODIS DB, and MISR”
Page 4302, Lines 25-26: “Hyer et al. (2001)” changed to “Hyer et al. (2011)”
Page 4302, Line 26: “for different sites in the same region.” changed to “for different sites in the same geographical region.”
Page 4303, Line 12: “dust, smoke, and pollutant” changed to “dust, smoke, and pollutants”
Page 4303, Line 13: “transports are shown” changed to “transports are also shown.”
Page 4303, Line 14: “the West Coast of US” changed to “the West Coast of the US”
Page 4303, Line 22: “and sampling biases” changed to “as sampling biases”
Page 4303, Line 24: “not found from the spatially” changed to “not found in the spatially”
Page 4304, Line 1: “0.5 and are over the sparsely vegetated land” changed to “0.5 that appear over sparely vegetated land”
Page 4304, Line 3: “which were deviating from” changed to “which deviate from”
Page 4304, Line 16: “Deep Blue” changed to “MODIS DB”
Page 4304, Lines 20-21: “Fig. 3a and b shows the spatial plot of the AOD
ratio of the MODIS DT (MODIS DB) AOD divided by MISR AOD” changed to “Figs. 3a and 3b show spatial plots of the MODIS DT and MODIS DB AOD divided by the MISR AOD”
Page 4304, Line 22: deleted the extra space before the comma after “MISR”.
Page 4304, Line 25: “MODIS DB” changed to “MODIS DT”
Page 4305, Line 8: “Therefore, the AOD differences between MODIS DT (MODIS DB the tendency for MODIS DT AOD) and MISR AOD at the green channel are also shown in Fig. 3c and d.” changed to “Therefore, the AOD differences (MODIS DT – MISR) and (MODIS DB – MISR) for the green band are shown in Figs. 3c and 3d, respectively.”
Page 4305, Line 20: “multiple scattering regimes” changed to “the multiple scattering regime”
Page 4305, Line 23: “slope + interception” changed to “slope + intercept”
Page 4306, Line 2: “in intercept” changed to “in the intercept”
Page 4306, Line 17: “have large uncertainties” changed to “cause large uncertainties”
Page 4307, Line 20: “at the visible” changed to “in the visible”
Page 4308, Line 5: we have rewritten the sentence as “For example, numerous field campaigns have been conducted over regions such as 5–10°S and 60–70°W of South America (e.g., Reid et al, 1998, 2005, SCAR-B and SMOCC campaigns), where many AERONET data are available. Even with extensive in situ and ground based observations, such regions may also reveal the difficulty of fully understanding aerosol properties and their spatial/temporal variations from limited ground and in situ observations.”
Page 4308, Lines 17-18: “The use of global statistics to measure” changed to “The use of ‘global’ statistics from AERONET to measure”
Page 4308, Line 26: “in Amazon region” changed to “in the Amazon region”
Page 4309, Line 19: “North India” changed to “Northern India”
Page 4310, Line 2: “Seventeen” changed to “seventeen”
Page 4310, Lines 18-19: deleted “(type C region)”
Page 4311, Line 1: “The AERONET has data from” changed to “AERONET has data from”
Page 4311, Line 16: “measurements that cam be made” changed to “measurements can be made”
Page 4312, Lines 11-12: deleted “Comparisons of spatially and temporally collocated MODIS and MISR aerosol op- tical depth data revealed that”

Page 4312, Lines 12: “the ratio” changed to “The ratio”
Page 4312, Line 15: “South America, and the Arabian Peninsula, Western Australia” changed to “South America, the Arabian Peninsula, and Western Australia”
Page 4312, Line 19: “of the comparisons” changed to “at the comparisons”
Page 4312, Line 20: “high AOD ‘features’,” changed to “high AOD ‘features,’”
Page 4312, Line 27: “Levy et al. (2011)” changed to “Levy et al. (2010)”

References: Some of the references need to be checked for consistent format and capitalization. Zhang et al. (2008a) and (2008b) need to be indicated in the reference list.
Done.

Reference:
Page 4313, Line 17: Added three references:
“Anderson, T. L., Charlson, R. J., Winker, D. M., Ogren, J. A., and Holmén, K.: Mesoscale variations of tropospheric aerosols, J. Atmos. Sci., 60, 119–136, 2003.”

Diner, D. J., Abdou, W. A., Bruegge, C. J., Conel, J. E., Crean, K. A., Baitley, B. J., Helmlinger, M. C., Kahn, R. A., Martonchik, J. V., Pilorz, S. H., and Holben, B. N.: MISR aerosol optical depth retrievals over southern Africa during the SAFARI-2000 dry season campaign, Geophys. Res. Lett., 28, 3127–3130, 2001.

Diner, D. J., Beckert, J. C., Bothwell, G. W., and Rodriguez, J. I.: Performance of the MISR instrument during its first 20 months in earth orbit, IEEE Trans. Geosci. Remote Sens., 40, 1449–1466, 2002.”

Page 4314, Line 26: Added two references:
“Kahn, R. A., Garay, M. J., Nelson, D. L., Yau, K. K., Bull, M. A., Gaitley, B. J., Mar- tonchik, J. V., and Levy, R. C.: Satellite-derived aerosol optical depth over dark water from MISR and MODIS: Comparisons with AERONET and implications for climatolog- ical studies, J. Geophys. Res., 112, D18205, doi:10.1029/2006JD008175, 2007.

Kahn, R. A., Garay, M. J., Nelson, D. L., Levy, R. C., Bull, M. A., Diner, D. J., Mar- tonchik, J. V., Hansen, E. G., Remer, L. A., Tanré, D.: Response to “Toward unified satellite climatology of aerosol properties. 3. MODIS versus MISR versus AERONET”, J. Quant. Spectrosc. Ra., 112, 901–909, 2011.”

Page 4314, Line 31: Added two references:
“Liu, Y., Koutrakis, P., Kahn, R., Turquety, S., Yantosca, R. M.: Estimating fine partic- ulate matter component concentrations and size distributions using satellite-retrieved fractional aerosol optical depth: Part 2–A case study, J. Air Waste Manage. Assoc., 57, 1360–1369, 2007.

Martonchik, J. V., Diner, D. J., Kahn, R., Gaitley, B., and Holben, B. N.: Comparison of MISR and AERONET aerosol optical depths over desert sites, Geophys. Res. Lett., 31, L16102, doi:10.1029/2004GL019807, 2004.”

Page 4315, Line 30: Added two references:

“van Donkelaar, A., Martin, R. V., Brauer, M., Kahn, R., Levy, R., Verduzco, C., and Villeneuve, P. J.: Global estimates of ambient fine particulate matter concentrations from satellite-based aerosol optical depth: Development and application, Environ. Health Perspect., 118, 847–855, 2010.

van Donkelaar, A., Martin, R. V., and Park R. J.: Estimating ground-level PM2.5 using aerosol optical depth determined from satellite remote sensing, J. Geophys. Res., 111, D21201, doi:10.1029/2005JD006996, 2006.”

Page 4315, line 33 “Zhang, J. and Reid, J. S., Turk, J., and Miller, S.: Strategy for studying nocturnal aerosol optical depth using artificial lights, Int. J. Remote Sens., 29(16), 4599–4613, 2008.” changes to “Zhang, J. and Reid, J. S., Turk, J., and Miller, S.: Strategy for studying nocturnal aerosol optical depth using artificial lights, Int. J. Remote Sens., 29(16), 4599–4613, 2008a.”

Page 4316, Line 11 “Zhang, J., Reid, J. S., Westphal, D. L., Baker, N. L., and Hyer, E. J.: A system for operational aerosol optical depth data assimilation over global oceans, J. Geophys. Res., 113, D10208, doi:10.1029/2007JD009065, 2008.” changes to “Zhang, J., Reid, J. S., Westphal, D. L., Baker, N. L., and Hyer, E. J.: A system for operational aerosol optical depth data assimilation over global oceans, J. Geophys. Res., 113, D10208, doi:10.1029/2007JD009065, 2008b.”

Tables and Figures:
Table 1: “Sollar Village” changed to “Solar Village”
Fig. 1: Corrected the “Solar Village”
Fig. 2: Fixed the order of panels.
Fig. 2: “corresponding” changed to “corresponds”
Fig. 3: “Similar as” changed to “Similar to”
Fig. 3: Added “Note the color scales are different between the top and the bottom panels” in the end of the caption.
Fig. 4: Fixed the corresponding spell in the figure. Also changed “Interception” to “Intercept”.