We would like to thank the Reviewer for carefully reading of manuscript and for numerous useful suggestions.

1) I found that the main interesting point of the paper is Figure (4), which depicts the variation of the advection of mineral dust, can affect the single scattering albedo. However the explanations given by the authors are rather confusing, e.g. L177 "stronger contribution of dust over the ocean than over the continent".
This statement is counter-intuitive because dust sources are located over the continent and AOD over the continent is also higher.

We agree that this sentence is counter-intuitive. AOD is indeed stronger above the continent than over the ocean because the atmosphere also contains aerosols issued from biomass burning occurring south of our region of interest. As transport follows a NE-SW direction in winter, dust coming from the NW of Mauritania is partially seen over the continent (in AOD and SSA) and its main signature should be seen over the ocean. Hence, we attribute the high SSA values encountered over the Ocean to dust originated from this NW Mauritanian source which should exclusively be composed of mineral dust.
We have modified the text L225-227 (in the new version) to clarify our explanation.

2) *As well in the conclusion L324, "MAM is being closer to the summer situation": this is not the case for the SSA for which we observe a gradient between land and ocean while the vertical distribution is similar. You must clarify this point.*

L324 (in the previous version), we were referring to the vertical distribution when stating that "MAM is being closer to the summer situation". However, SSA over the ocean is indeed higher than over the continent (Figure 4). The same reason as mentioned above applies here. Over the continent, AOD is high in the southern part of our domain (Figure 3b) where aerosols from biomass burning mix with aerosol dust giving SSA values lower than 0.9 (Malavelle, 2011). As the transport is still NE-SW, SSA over the ocean still records a higher contribution of mineral dust over the ocean than the continent. This explains the higher SSA over the ocean. Comment was added in the text L391.

3) *Although it could be interesting to use a different zonal area for summer and winter because the dust transport follows a E-W direction during summer while it is NE-SW during winter as depict by Figure (3).*

Our objective was to study the vertical distribution of mineral dust and to better understand the fate of dust through the land-ocean transition. We therefore tried to prevent the influence of other aerosols coming from biomass burning because they have different optical and chemical properties and hence have a different fate. As biomass burning occurs south of 12°N in winter and spring time (Engelstaedter et al., 2007), we decided to take this latitude as southern limit. We also wanted to keep a coastline oriented as "north-south" as possible in order to be able to locate the continent-ocean transition before looking at the aerosol properties above the ocean and land. As the coastline is oriented northeast/southwest north of Cape Blanc, we

chose 21°N as northern limit. But indeed, winter and summer main transport directions are different but we believe the choice of this latitude band allows to capture most of the mineral dust signal.

4) - L44. Clarify this sentence and add relevant references. Explain how the AOD retrieval depends on vertical extent of the dust layer.

Based on perturbations induced by the Rayleigh scattering for the detection of absorbing aerosols, Chiapello et al., (1999) showed that TOMS AI is most sensitive to aerosols at high altitudes. We have added the a sentence to clarify this statement in the text L55-57.
The results of these authors were also related by Kaufman et al. (2005).

5) Provide information on the quality level (level 1.5 or level 2) and temporal resolution (daily mean or temporal window around satellite overpass). It appears later in the text that you have used monthly means.

AERONET is available under three different products: Level 1.0, 1.5 and 2.0. In this study, we have used Level 1.5 for Cape Verde and Level 2.0 for the other stations. We used Level 1.5 product for Cape Verde due to a lack of sufficient Level 2 data for this station.
Level 1.5 data are raised to Level 2.0 (quality-assured) after final calibration values are applied and manual data inspection is completed (http://aeronet.gsfc.nasa.gov/new_web/man_data.html; Smirnov et al., 2000a). At Level 1.5, the minimum aerosols optical depth ($\tau_{ai\ min}$) is identified at each wavelength (τ_{ai}) and for each station. If the difference $\tau_{ai} - \tau_{ai\ min}$ is less than the maximum of ($0.05*\tau_{ai\ min}$, 0.02) for each channel, then cloud is affected to this record. If this screening removes all but one point from a series then an additional criterion is applied to the spectral channels. If the Angström parameter computed using all available channels between 440 and 870 nm is greater than -0.1, then the point is considered cloud and pointing error free.
The final post-deployment calibration values are applied to the data set for producing Level 2.0 products. The spectral channels are evaluated for data anomalies, filter degradation or other possible instrument failures. The data are also inspected for possible cloud contaminated outliers.
Concerning the temporal resolution of AERONET observations, we computed a “daily” mean based upon data collected between 10am and 3pm in order to use observations collected during the same time window as satellite overpass. We then used these 10am-3pm daily averages to compute monthly 10am-3pm AOD.
The complementary information is added to the text L100-102.

6) L65. AE is an optical parameter. Extensive (AOD) and intensive (SSA, AE) parameters are more appropriate.

We took this remark into account and modified the text accordingly L82.

7) L78. Improve the description of uncertainties on aerosol parameters.

The uncertainty we are talking about L79 (in the previous version) concerns AERONET data. This uncertainty is inherent in the algorithm inversion used to retrieve aerosol characteristics. Some approximations are used in the

numerical inversion algorithm which produce errors named relative errors having a standard deviation of 0.01 (Dubovik et al., 2000). A comment was added in the text L96-98.

8) L125. Clarify what is MDOF and what is p(x,y,z). Please refer to Adams et al (2012 and clearly define equation (1) and explain all the terms.

We are not sure to properly understand Reviewer's comment. MDOF is the Mineral Dust Occurrence Frequency (L151). In equation (1), p(x,y,z) is equivalent to MDOF. Indeed, it is not a probability of occurrence but a frequency of occurrence. L159
We added the following explanation of equation (1) .
The Occurrences in the longitude (x) are summed and normalized by the total valid satellite passes in a given longitudinal range (35°W-20°E).
p is the resulting occurrence frequency at the grid point, s the number of valid satellite passes at the same grid point, and N the number of grid points in a specified longitudinal range. It was now clarify in the text L160-161.

9) Figure 1 and related text starting L145. Compare AOD for the same wavelength. You can interpolate the sun photometer AOD at 500 nm from AOD at 440 and 675 nm.
Comment the regression coefficients you have obtained. In particular, explain why the regression for M'Bour site is significantly different from the others.

We agree with Reviewer. We now have interpolated (L176-177) AERONET AOD at 500 nm from AOD at 440 and 675 nm (new Figure 1). The correlations between AERONET and satellite data did not change significantly, nor the slopes or intercepts of the linear regression. L180-181
Indeed, the regression of AOD for M'bour site is not as good as for the other sites. M'bour is located at the shore at the interface between land and sea. The satellite algorithm retrieval is not the same over the land and over the ocean. As M'bour experiences both oceanic and continental influences (notably through wind diurnal cycles), we believe the AOD retrieval at the shore is more complexe than in land (Banizoumbou and Agoufou) or at sea (Cape verde). L183-185

10) L165. Correct sentence. The http link must be in the data description section.

This sentence was corrected accordingly L197
The link was now moved in the data and methodology section. L125

11) L167 and Figure (2). It is unclear which wavelength you have used for the comparison.
Please rewrite Figure (2) caption and avoid unnecessary information on site location. Why did you use daily data rather than monthly data as for the AOD validation ?

The right wavelength which used in this work is now written in the text L199
Figure 2 caption was wrong, we have now corrected it. The right wavelength is indicated on the x- and y- axes in the figure. We also removed unnecessary information about site location.

For the evaluation of the performance of satellite SSA retrievals we indeed used daily AERONET SSA using observations between 10am and 3pm. We used these daily observations to obtain significant correlations and robust regressions (see also our response to comment number 15 of Reviewer #2).

11) Figure 3. It is not possible to read the SSA contour lines. Provide an additional figure with SSA regional pattern.

We believe the superimposition of SSA contour levels onto AOD is better since they both represent mineral dust characteristics. We have improved the quality of our Figure 3. We hope this new Figure 3 will indeed be easier to read.

12) L232. Rewrite sentence and defined correctly which layer you are talking about.

According to Reviewer's remark, we reformulated the sentence as follow:
"Unlike winter, dust are concentrated between the higher layers of the ABL, from one to 5-6 km (Fig. 5C; Gamo, 1996), in response to intense convective mechanisms that are more common in the region at this season (Cuesta et al., 2009)." L282-283

13) L230. How do you use the AE ? Please clarify and clearly state this in the data and method section.

We agree with Reviewer. We now have clarified our use of AE in the data and method section.
Here we use aerosols optical thickness larger than 0.2 when Ångström Exponent is lower than 0.7 (see L116). This methodology is based on AOD and AE to characterise mineral dust and has already been used by Ben-Ami et al., (2010) and Drame et al., (2015).

14) L240. Explain the link between gravitational settlement and SSA. This whole paragraph is unclear. However it is of highly importance to get your point on the link between the dynamic of the dust transport and the optical properties. Consider also revising L298.
We did not intend to link the settlement of large particles to SSA properties. SSA remains high and roughly constant throughout the continent and over the ocean. We believe summer AOD in northern Africa is largely dominated by mineral dust which could explain the high SSA values encountered at this season. L294
We understand that the paragraph starting L298 (in the previous version) could be misleading. We therefore clarify this point in the manuscript. L364

Technical comments:
- Avoid use of "desertic aerosol". Prefer desert aerosol or better mineral dust
We have changed "desertic aerosol" expression accordingly throughout the manuscript (in the title and in the whole text)
- L42: correct sentence between brackets
Corrected accordingly (L53)
- L125: Adam must be outside brackets
Corrected accordingly (L154)