The authors are very grateful for the comments of the reviewer, which helped to significantly improve the quality of the paper.

1. *The authors provide very interesting observation of aerosol absorption spectral dependence from UV to visible. However, these properties were derived differently: in visible from AERONET, in UV from matching irradiance measurements. In principle, one can imply that the observed differences in aerosol properties can be caused by differences in type of observations. At the same time, the authors show some irradiance measurements were available in visible too. I would suggest to the author considering to check the consistency of these two types of observation. For example, by trying to model irradiances in visible using AERONET retrieved properties. The authors also could outline more clearly if spectral trends observed in AERONET data agree with the observation of increased aerosol absorption in UV. (it seems they well agree?)*

We have rewritten this part of the text. The model comparisons now have been made with one minute resolution data which help to make the consistent comparisons between total shortwave irradiance at BOA (using AERONET RT model), UV300-380 and erythemally-weighted irradiance (TUV model). Yes, we have a very good agreement between measurements and model shortwave irradiance with AERONET SSA values. See the added text:

"There is a perfect agreement between model and measured shortwave irradiance. On the whole there is no any bias, standard deviation is about 3%, and maximum difference does not exceed 10%."

However, for UV if we use the same SSA we will obtain significant model overestimation. The SSA_UV values for each series of measurements have been retrieved. They are much smaller than in visible. See the text below and the new Figure 11. Table 3 has been removed.

"Fig.11 also presents the comparisons made for UV spectrum. When calculating UV irradiance we used here the available SSA values at 441nm. One can see that the application of SSA from visible spectral range has led to dramatic difference between UV measurements and modeling of about 50% at large AOT.

Using the approach described above we calculated the SSA_{UV} values, which would give the perfect agreement with UV measurements. According to our estimations the SSA_{UV} should be significantly lower to match model irradiance with UV observations (see Fig.11) both for UV300-380nm and for EW irradiance, which has the maximum in UV-B spectral region. For UV300-380nm irradiance the SSA_{UV} should be around 0.9, and it should be around 0.8 for EW irradiance. This is quite reasonable because the high concentration of organic compounds in smoke aerosol can dramatically increase the aerosol absorption coefficient in UV and especially in UV-B spectral region (Sviridenkov, 2008). At the same time we obtained quite pronounced decrease of SSA values with the AOT500 increase (see Fig.11). The existing dependence between AOT and SSA at extremely high AOT values can be observed due to more fresh aerosol "fire" cloud, which have both larger AOT and higher content of organic component. However, further analysis is necessary to verify the possible uncertainty of the retrievals in these conditions.

As a result, we can state that the dramatic UV irradiance loss compared with total shortwave irradiance is explained by several factors: by higher AOT in UV from 0.2 up to 1.2, lower SSA_{UV}~0.8-0.9 with the tendency of SSA_{UV} decreasing with AOT increase, and by some additional effects of gas absorption (few percents). "

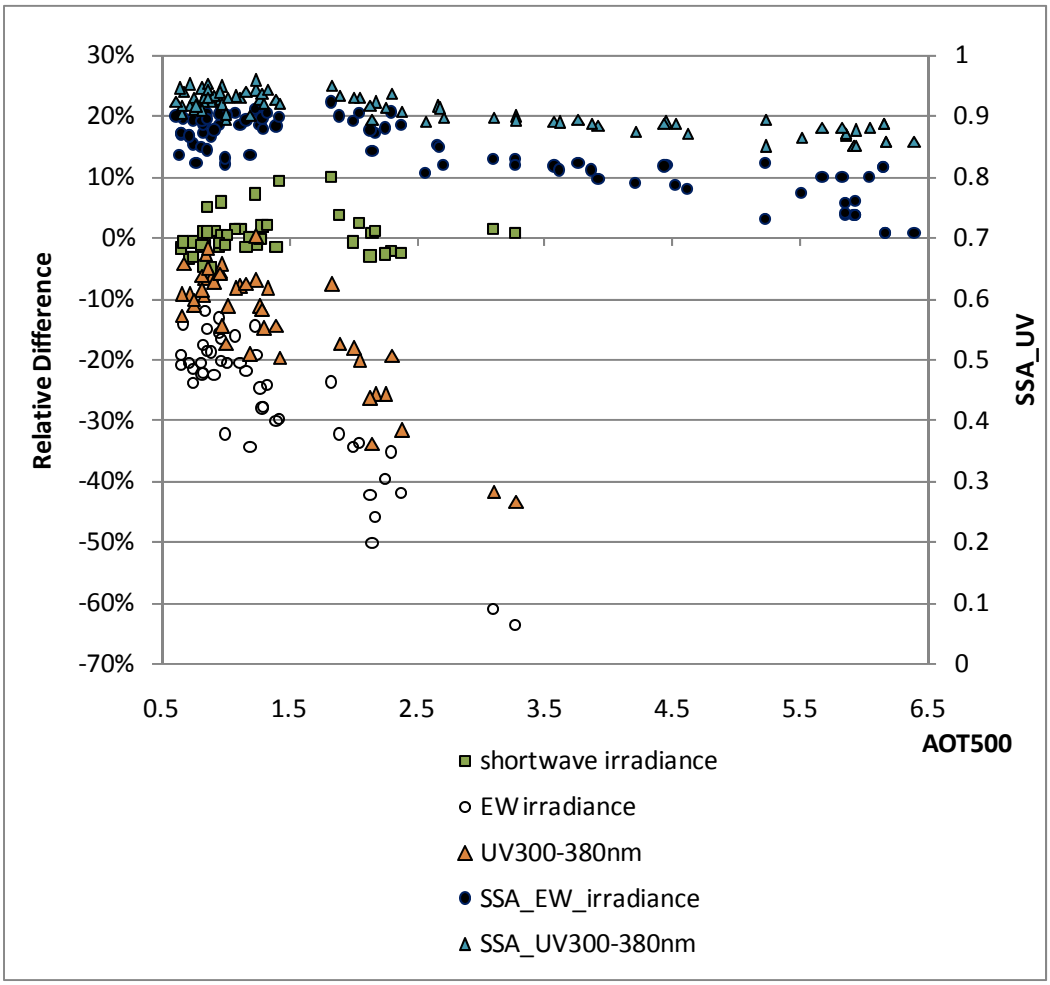

Fig.11.Comparisons between measurements and modelling (Relative Difference=Measurement/Modelling-1,%) for shortwave irradiance , UV300-380nm and EW irradiance (left axis) and the retrievals of SSA for EW irradiance and UV300-380nm (right axis). See the details in the text.

2. Figure 11 shows the dependence of aerosol radiative forcing as a function of aerosol optical thickness. It seems that the authors did not account for the fact that aerosol radiative forcing depends on solar zenith angle because since direct solar flux at the surface naturally depends on solar zenith angle. For example, the author case see illustrations of this effect in both measured fluxes and modeled from AERONET in the paper by Derimian et al. 2008. I believe if the authors account for the dependence of the forcing on solar zenith angle, the spread in Fig. 11 will decrease and the regression trends will improve. Full reference: Derimian, Y., J. -F. Leon, O. Dubovik, I. Chiapello, D. Tanré, A. Sinyuk, F. Auriol, T. Podvin, G. Brogniez, and B. N. Holben, "Radiative properties of aerosol mixture observed during the dry season 2006 over M'Bour, Senegal (African Monsoon Multidisciplinary Analysis campaign)", J. Geophys.Res., 113, D00C09, doi:10.1029/2008JD009904, 2008.

The obtained results showed that contrary to the RFE at the BOA the dependence on solar zenith angle is not very large - few Wm-2 in a large range of sza 50-75 degrees. We have included the discussion on

the recommended paper and other papers in the text. The RFE is very sensitive to SSA that explains the deviation in typical conditions. On the other hand to obtain the climatological effect we need to use all available statistics in clear sky conditions at different SZA, SSA, AOT,etc. The text has been changed.

See the text:

"Since the radiative aerosol properties were quite similar during the fires 2002 and 2010, we combined all the data in order to obtain the dependence of RFE versus AOT500. In addition, we obtained the average dependence of RFE versus AOT500 for typical clear sky July-August conditions during 2001-2009. For these two groups we combined all available RFE retrievals within the wide range of aerosol characteristics and solar zenith angles in 50-75° range. Note, that there is only a slight RFE dependence on solar zenith angle within few Wm^{-2} (Derimian et al., 2008 (Fig.9b there), Haywood and Shine, 1997) at relatively low surface albedo typical for summer conditions. However, using the whole statistics we take into account for these slight changes when characterizing the climatic effect of aerosol."

3. Figure 6 shows the errors bars for the retrieved size distribution. Those errors bars are not very realistic for the values corresponding to the very small and very large particles (too small). They show look more like in the paper by Dubovik et al. (2000). I understand that those errors bars were taken from the AERONET code output. However, I am aware that those error bars should be corrected for size distribution (for other parameters they are ok). I suggest, either to remove the errors bars for size distribution or contact the AERONET code developers and get updated errors bars for size distributions.

The error bars demonstrate the confidence interval at 95%. They were calculated using the simple standard statistical approach:
*Conf=1.96*st.deviation/N^0.5.*
The error bars demonstrate ONLY this standard statistical variation of the analyzed samples. We do not have a task to analyze the real errors of retrievals of size distribution. We changed "error bars " term to "confidence intervals" for better clarification.

"Fig.6. Mean aerosol volume size distribution in fire conditions (red), August 2010, and typical August conditions (black) with the confidence intervals at 95%. AOT500 values in the legend are the averages corresponding to the samples. Moscow."