E. T. Sena and P. Artaxo: A novel methodology using MODIS and CERES for assessing the daily radiative forcing of smoke aerosols in large scale over the Amazonia.

The manuscript introduced a novel method for defining smoke aerosol radiative forcing over Amazonia using satellite data. The key improvement in this method is that the aerosol forcing can be defined on a daily basis. In addition, the satellite-based results compare well with the AERONET inversions, which is promising. I recommend the publication of this article after some revision of the current version of the manuscript. One of the major issues relates to the terminology and the exact definitions of the key parameters (e.g. aerosol forcing, clear vs. aerosol-free environment). The authors should be more clear in which kind of satellite-based studies their method could improve the temporal resolution, and also discuss a bit about the limitations of this method. From this current version of the manuscript the reader might get the impression that this specific method could be used to improve all the previous studies where coincident CERES and MODIS satellite observations were used to estimate the direct aerosol radiative effect (forcing), which, to my understanding, is not true.

General comments:

1) The abstract is too long and in some parts too detailed. The authors should rewrite the abstract in a more concise way, focusing on the key findings.

2) The authors should define more clearly already in the introduction what they mean by DARF, i.e. that it considers the direct aerosol radiative forcing of smoke aerosols only. Also, they should be more specific when discussing about ”previous studies” that also used coincident CERES and MODIS observations to define the direct aerosol radiative forcing (/effect), especially whether those studies considered the radiative forcing of all aerosols or only of some specific aerosol type. The difference is that in this kind of specific forcing study both polluted (smoke) and background (clean) (AOD<0.1) SW TOA fluxes can be observed. On the other hand, when considering the total aerosol forcing, the aerosol-free flux (i.e. AOD=0) can not be observed. Therefore, at least in some of the ”previous studies” referred in the current manuscript, coincident AOD- TOA flux observations over longer time period (months) were needed in order to get an estimate for the mean aerosol-free flux, which also set the boudaries to the temporal resolution in which the total aerosol radiative forcing could be defined. I.e. if understood correctly, your method can be used to define F_clean – F_pollution at high temporal resolution but not F_aerosol-free – F_all aerosol.

   For example in Sect. 3.3 authors could emphasize already earlier in the section that in the ”previous studies”, i.e. Patadia 2008 and Sena et al. 2013, the aim for using coincident AOD-TOA flux satellite observations was to find the mean TOA flux for aerosol-free conditions (AOD=0) but in this study the ”clean” environment is defined as AOD<0.1. I.e the ”previous studies” actually defined the total aerosol forcing. In the case of Amazonia the total aerosol forcing is most probably nearly the same as smoke aerosol forcing, but generalizations to other kind of environments do not necessarily work similar way.

3) The water vapour content variation had been taken into account in the radiative transfer simulations but how large effect these variations could have when defining the instantaneous satellite-based forcing?

4) In Sect. 3.3. the discussion about Figure 5 could be more concise, the different explanations could be e.g. listed and then discussed in more detail.

5) Since this method defines only cloud-free smoke aerosol forcing, the authors could give a rough estimate of how large proportion of all the possible satellite overpasses are cloud-free (and cloudy) during the forest fire season over Amazonia.

Specific comments:

Sect. 4: ”Validation of aerosol forcing” (also later in the Section); I would suggest to use ”comparison” instead of ”validation” since both the AERONET inversions and the model simulations are not ”direct” measurements.

Figures:
Figure 1 and 4 captions: Which is the time period when these observations were collected?

Figure 6: From which data are these lines defined? (Many grid cells or one grid cell, one year or multiple years...)