The authors have addressed most of my comments on the original version of the manuscript. Nevertheless, I think that while the paper seems otherwise useful and scientifically sound, it is still somewhat let down by lack of clarity in writing, especially in Section 2. Most of my remaining suggestions (most importantly, comment 2) are concerned with this.

Minor comments

1. lines 15 and 23: To be absolutely clear, you should use "anthropogenic direct radiative forcing" here (to help those readers who have not accustomed to the practice that "forcing" always refers to the anthropogenic part).

2. While some clarifications have been added to Sect. 2, it still took me a lot of effort before I (hopefully!) finally understood it. To make this easier, I think it would help substantially if the reader knew beforehand, what the data will be used for. Therefore, I recommend to start Sect. 2 with a "preamble" paragraph where this is explained, something like this (I hope it approximates the truth sufficiently well):

In sections 4 and 5 and Table 1, aerosol direct radiative effects (DRE) will be computed for three cases: (i) for the total aerosol, (ii) for the fine mode, and (iii) for fine mode sea-salt and dust. The total and fine-mode AOD are based on observations, as explained in Sect. 2.1. The other aerosol optical properties needed for the DRE calculation are derived as follows:

- *The asymmetry parameter (ASY), the single-scattering albedo (SSA) and the SSA Ångström exponent (CAl_AE) for the total aerosol are derived by nudging GOCART simulated values towards AERONET data (Sect. 2.2). The spectral dependence of ASY is addressed as in Chung et al. (2005).*

- *The fine-mode aerosol DRE is computed as the difference between the total and coarse mode DREs. The coarse-mode ASY, SSA and CAl_AE are derived from GOCART simulations, as reported in Sect. 2.3.*

- *For computing the DRE due to fine-model sea-salt and dust, ASY, SSA and CAl_AE are derived from GOCART simulations (Sect. 2.3).*

The datasets used to derive this information are explained in the following. All the datasets used in this study are monthly means.

3. On lines 79–80, it is stated that coarse-mode AOD at 500 nm is obtained by subtracting fine-mode AOD from total AOD at 500 nm, and on lines 84–85 that the fine-mode AOD at 550 nm is obtained by subtracting the coarse-mode AOD at 500 nm from the [total] AOD at 550 nm. It is hard not to become puzzled here! Would it be clearer to say: *The fine-mode AOD at 550 nm is derived by adding the difference in total AOD between 550 and 500 nm to the fine-mode AOD at 500 nm, subject to the assumption that the coarse-mode AOD does not change between 500 and 550 nm?* Because this is what these sentences seem to imply:

$$fAOD_{550} = fAOD_{500} + (AOD_{550} - AOD_{500}) \tag{1}$$

4. On lines 89–90: "We apply a similar procedure to ASY (asymmetry parameter) and other aerosol optical properties". What does "other" include? Only CAl_AE?

5. Equations should be separated better from the text, (at least) on lines 114–117, 130, and 132.

6. Lines 144–147: if you accept my suggestion on the "preamble" of Sect. 2 (comment 2), this paragraph should be deleted. Indeed, currently it creates another potential confusion: "As for the optical properties (for example, SSA) for fine-mode aerosols, we do not need to address them . . .", yet on lines 156–159, the optical properties for fine-mode dust and sea salt are discussed.

7. line 154: Delete "amount of" in "the amount of dust AOD".

8. On line 316: In math, < -0.11 means "more negative than -0.11". But is that what you want to say here? If you mean "less negative than -0.11", say exactly that.

9. line 334: Add paper number (D10205) for Bellouin et al. (2008).

10. Caption of Fig. 4. This should read "...for each calendar month". Furthermore, the dot size scale is equally uninformative as in the first version. Assuming that you have some quantitative limits to decide whether the dot size should be 1, 2 or 3, why not tell this to the reader?

11. Fig. 5, second panel: to be consistent with the terminology elsewhere, replace "Corresponding TOA forcing" with "Corresponding TOA radiative effect".