

Interactive comment on “Variations in the physicochemical and optical properties of natural aerosols in Puerto Rico – Implications for climate” by Héctor Rivera et al.

Anonymous Referee #1

Received and published: 6 September 2018

General Comments:

The authors are utilizing observations of aerosol properties, performed both at surface and in the atmospheric column, which are further classified by the air masses arriving over the Cape San Juan Atmospheric Observatory in Puerto Rico, in order to roughly estimate the aerosol impact on the direct radiative forcing. The manuscript is well written with a good scientific sound and thus to my opinion worth being published in the Atmospheric Chemistry and Physics journal. However, in order to be improved I kindly suggest to the authors to take into consideration the following comments.

Specific Comments:

C1

1. Page 2, line 2: “because of their difference”. Maybe “because of their great variability” is more suitable.
2. Page 2, line 25: “space-time” instead of “pace-time”
3. Page 6, line 6: “impossible values”. I think that “and data with no physical meaning” is more appropriate.
4. Page 11, line 4: Consider deleting the second “because” due to redundancy.
5. Page 11, line 12: Since the letters α and β are also used when referring to aerosol properties (also within the manuscript), for not misleading try to avoid using them, and instead just replace them with x and y (or with any other letter that is not used for referring to something else).
6. Page 11, line 33: I agree with this explanation however, you have to exceed the 50-60% of RH in order to enhance the scattering efficiency by a factor of around 1.5. Do these RH levels occur during July over the site of observation?
7. Page 12, line 10: Please mention to what “SA” refers to.
8. Page 12, line 10: Is it possible that only 2-3 observations of BC (?) can affect so much your 4 years of statistics? I have some doubts on this, which are getting stronger when looking that the statistically mean and median values of absorption which are almost the same. This is true for both months of September and October.
9. Table 2 is not a table but a Figure. In this figure try to be consistent and use either “Y” & “N” or “Yes” & “No”. Also provide the threshold value missing in scattering efficiency of CM.
10. In Table 1 please correct VA refers to Volcanic Aerosol and not to Volcanic Ash. This is the secondary sulfate portion, associated to the fine mode fraction of the volcanic plume. Is this the reason behind the relatively high values (compared to the ones observed for AD) of Angstrom exponent and single scattering albedo presented for VA

C2

in Table 2?

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-791>,
2018.