

Atmos. Chem. Phys. Discuss., referee comment RC2
<https://doi.org/10.5194/acp-2021-419-RC2>, 2021
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Comment on acp-2021-419

Anonymous Referee #2

Referee comment on "Aerosol radiative impact during the summer 2019 heatwave produced partly by an inter-continental Saharan dust outbreak – Part 2: Long-wave and net dust direct radiative effect" by Michaël Sicard et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-419-RC2>, 2021

Review of "Aerosol radiative impact during the summer 2019 heatwave produced partly by an inter-continental Saharan dust outbreak – Part 2: Long-wave and net dust direct radiative effect" by M. Sicard et al., 2021. The submitted manuscript, companion of ACP-21-6455, assesses, in radiative terms, the impact of a dust outbreak paired with an abnormal heatwave. The manuscript is scientifically interesting because those events will be more and more frequent because of climate change. The following issues should be addressed before publication:

- 1) From MPLNET data, it looks like that the dust contribution drops drastically after 27 June 2019 at noon. How can the authors be sure that this is dust and not a mixture of dust and local aerosols? How this impacts the refractive index choice used as input in Mie code? This is a source of possible uncertainty.
- 2) The longwave contribution is computed just from 5 to 19 UTC. Is there any reason for this time interval? Longwave radiation is not depending on sunlight.
- 3) The strength of this paper is paring the dust outbreak with a heatwave in terms of radiative effects. This should be better highlighted.
- 4) English should be revised because some sentences are not clear.

Specific comments can be found in the attached file.

Please also note the supplement to this comment:

<https://acp.copernicus.org/preprints/acp-2021-419/acp-2021-419-RC2-supplement.pdf>