

Interactive comment on “The impact of solar radiation on polar mesospheric ice particle formation” by Mario Nachbar et al.

Anonymous Referee #1

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General comments:

This is an excellent study on the impact of solar heating of meteoric smoke particles on the formation of NLC/PMC particles. The work is based on a combination of lab work and simulation results and is an important contribution to improve our understanding of the formation of ice particles near the polar summer mesopause. The manuscript is very well written, the results are substantial and appear to be robust. I did not find much to criticize and in my opinion the paper can be published more or less as is. I have a few minor comments that I ask the authors to consider.

Specific comments:

- Is anything known about the shape of MSP particles in the atmosphere and/or the

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MSP analogues in your experiments? If yes, this should be mentioned. I suggest stating in any case that the particles are most likely not spherical.

- Page 1, line 17: I suggest replacing “cold temperatures” by “low temperatures”, similarly on line 2 of the following page: “coldest temperatures” -> “lowest temperatures”
- Page 4, line 5: I would explain “Da”, despite the fact that many readers will know what it stands for.
- Page 6, line 4: Please explain “ad-layer”
- Page 7, 17: “show a linear trend with particle radius”. This is not the most precise way to put it. It may be misinterpreted as a linear relationship between absorption efficiencies and radius, which is not the case.
- Page 8, line 17: add space between degree sign and “(21”
- Same line: only a small point, but shouldn't the SZA be about 45.5 deg at 69 N and for summer solstice?
- Page 11, lines 4 and 5: It would be good to state, which solar irradiance spectrum was used? Why was $I(\lambda)$ “calculated” ?

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-1032>, 2018.

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