

Review of “Ice nucleating particles of the Eastern Mediterranean measured by unmanned aircraft systems” by Schrod et al.

In this paper, Schrod et al. leverage the use unmanned aircraft systems to measure the abundance of ice nucleating particles which are active in the immersion and condensation modes in the lower troposphere for the first time. The study is conducted in a region frequently influenced by Saharan dust emissions, making the results of particular importance to furthering our understandings of how desert dusts can impact upon clouds. During the study, a number of long-range transported dust events are captured, and the importance of dust as an INP in this environment is highlighted by correlation to PM10 mass, aerosol optical thickness and modelled dust concentrations.

The paper itself is well-written, and the work presented is both novel and likely to be of large interest to researchers interested in this topic. Even of the few remarks I have on the manuscript, most of these are relatively minor. As such, I recommend the paper for publication after consideration of the following:

Comments:

P1L5: It should be noted that here, and during all the other occurrences throughout the paper, that the plural of ice nucleating particle is “INPs” and not “INP”

P6L18: What is the efficiency of the sampling system (i.e. inlet + aerosol sampling unit) for different particle sizes?

P7L8-9: I think a very brief discussion of the limitations and possible caveats of the FRIDGEs measurement principles is pertinent here. While these are listed in Schrod (2016), a brief summary here would also be useful, as these are of course also central to this work.

P11L19: A brief mention as to what the physical meaning of the calibration factor, cf , is would be useful to the reader here.

P12L26-29: Can you show this good agreement by using a plot?

Section 3.2.2.: As you have n_s values, it might be interesting to compare your results to the lab-based parameterisation for the ice nucleating activity of mineral dusts developed by Niemand et al. (2012) and maybe even to that for feldspar by Atkinson et al. (2013), taking into account that only a fraction of the dusts are likely to be feldspar

P15, Line1: It should be noted here that Conen et al. examined the ice nucleating activities of dusts at much warmer temperatures than were probed here. That being said, a similar point is made by Tobo et al. (2014), which might be good to reference here.

References:

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DeMott, P. and Skrotzki, J.: A particle-surface-area-based parameterization of immersion freezing on desert dust particles, *J. Atmos. Sci.*, (2012), 2012.

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