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Comment on acp-2022-356

Anonymous Referee #1

Referee comment on "Measurement report: The Urmia playa as a source of airborne dust and ice-nucleating particles – Part 1: Correlation between soils and airborne samples" by Nikou Hamzehpour et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2022-356-RC1, 2022

Comments on the “The Urmia Playa as source of airborne dust and ice nucleating particles – Part 1: Correlation between soils and airborne samples”by N. Hamzehpour et al.

The authors collected soil and dust samples in the Urmia Playa area in northwest of Iran. Physicochemical properties of soil and dust samples are analyzed. Mineralogical composition, elemental composition, and enrichment factors of dust samples are analyzed to identify the dust source. Moreover, the ice nucleation ability of soil and dust samples is also analyzed. The authors found that the IN activity positively depends on organic matter and clay minerals, while negatively depends on salinity, pH, K-feldspar, quartz, etc., which is very interesting.

The manuscript is well organized, the subject is relevant, the results are well presented and discussed, and, perhaps most importantly, the manuscript deals with an area where relevant observations are relatively rare. I believe the manuscript is suitable for publication after a minor revision.

Minor points:

- I would like to see some discussions on what we learn from this study for the modeling community regarding the INP parameterization, in particular, for regional modeling over this area.
- Why the dust sample locations are away from the soil sample locations? Please clarify.
- The observed data and also post-processed data should be accessible even though during the review process.
- P4, L130: during -> from.
- P4, L132: "potential evaporation value" -> "an annual potential evaporation value".
- P25, L563: In most 2 wt% suspension cases, the second heterogeneous freezing peaks are still there. Please clarify.
- The title: "source" -> "a source"