

Referee comment on the revised version of “Impact of desert dust on new particle formation events and cloud condensation nuclei budget in dust-influenced areas” by Casquero-Vera et al., <https://doi.org/10.5194/egusphere-2023-1238>

Casquero-Vera et al. presented an extensive study of the impact of desert dust on the occurrence of new particle formation (NPF) events at five different dust-influenced sites. The authors showed that NPF events occur during dusty and non-dusty conditions, similarly, evidencing that NPF is not limited to highly dust outbreaks. Furthermore, the authors calculated the condensation sink (CS) in both fine (CS_F) and coarse (CS_C) modes. This calculation showed that the value of CS can be underestimated by 17% if the coarse mode is not considered.

The growth rates (GR_{10-25nm}) and nucleation rates (J_{10nm}) do not show a clear pattern of the effect of desert dust on the strength of the NPF event occurrence. This suggests that other important parameters might play a role, for example, the concentration of precursor gases, chemical composition, and meteorological parameters. The authors calculated the CCN potential by using the particle number size distribution and found that NPF events contribute to the CCN budget during dusty conditions.

The authors have discussed and carefully attended the comments and suggestions made by the two referees. The quality of the manuscript has improved and therefore should be considered for final publication in EGU sphere.