Supplement of Atmos. Meas. Tech., 19, 7097–7112, 2026
https://doi.org/10.5194/amt-19-7097-2026-supplement
© Author(s) 2026. CC BY 4.0 License.



Atmospheric Measurement Techniques
Open Access
EGU

Supplement of

Calculation of the impacts of aerosols on cloud microphysical properties by combining ground- and space-based measurements

Suzanne Crumeyrolle et al.

Correspondence to: Suzanne Crumeyrolle (suzanne.crumeyrolle@univ-lille.fr)

The copyright of individual parts of the supplement might differ from the article licence.

S1 Climatology

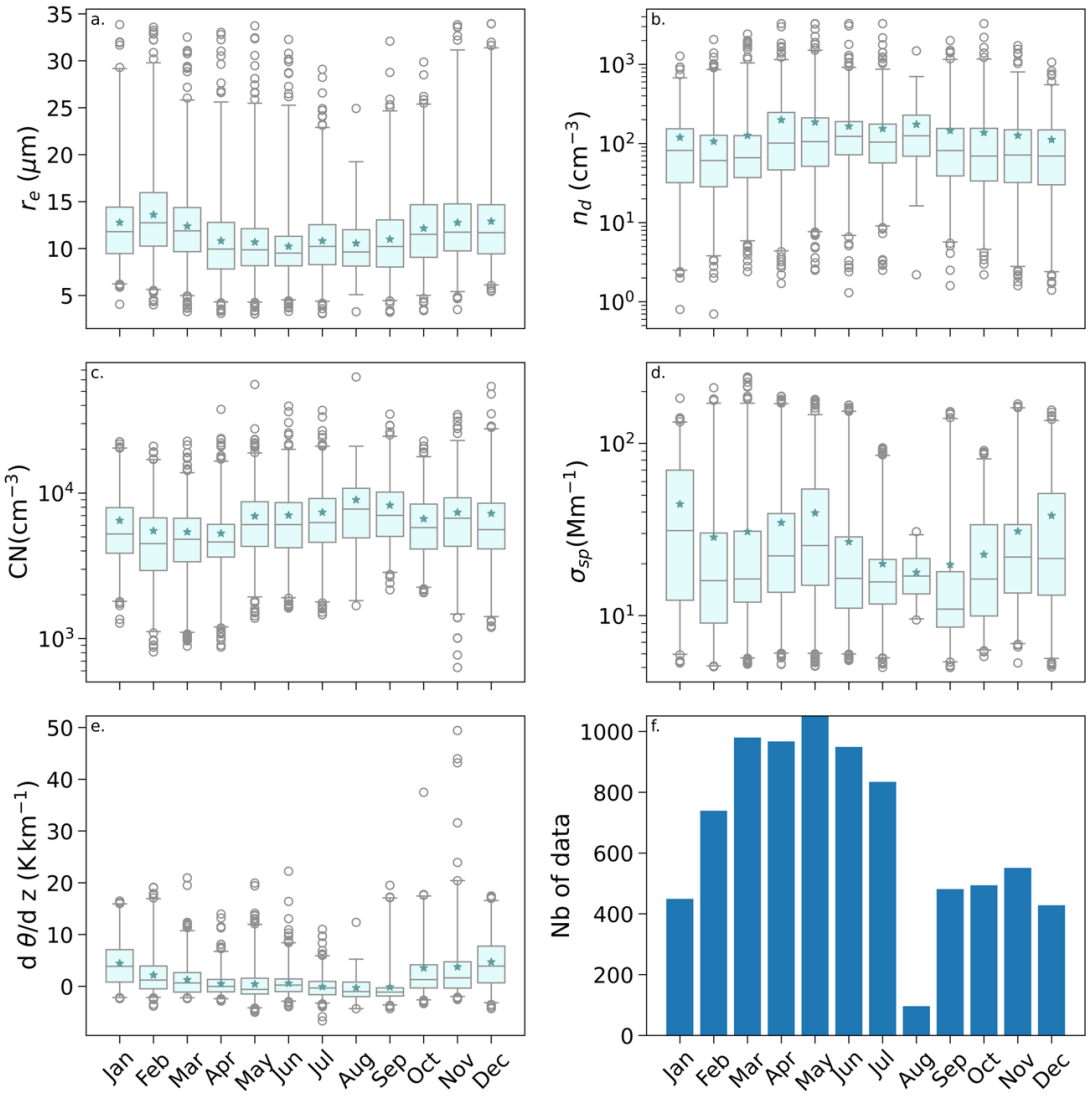


Figure S1 : Climatologies of (a) cloud droplet effective radius (r_e), (b) cloud droplet number concentration (n_d), (c) particle concentration (CN), (d) dried aerosol light scattering ($\sigma_{sp,525nm}$), (e) potential temperature vertical gradient ($d\theta/dz$), and (f.) the number of observations (Nb of data) over the ATOLL station when no filters are applied. For subfigures a to e, the box represents the interquartile range (25th–75th percentiles), with the median indicated by a horizontal line and the mean by the star. Whiskers extend to the 1st and 99th percentiles and outliers of the whiskers are shown as individual points.

Yearly distribution, shown in Figure S2, highlight that there is a large amount of data from 2023 (~ 44% of the filtered data). The unfiltered dataset (not shown) also shows more data in 2023, but the difference is less pronounced. We observed that all the other parameters do not show strong variations over the years. Stability does change slightly, but the impact is limited on the dataset, since the cases are still considered as stable according to our filtering method.

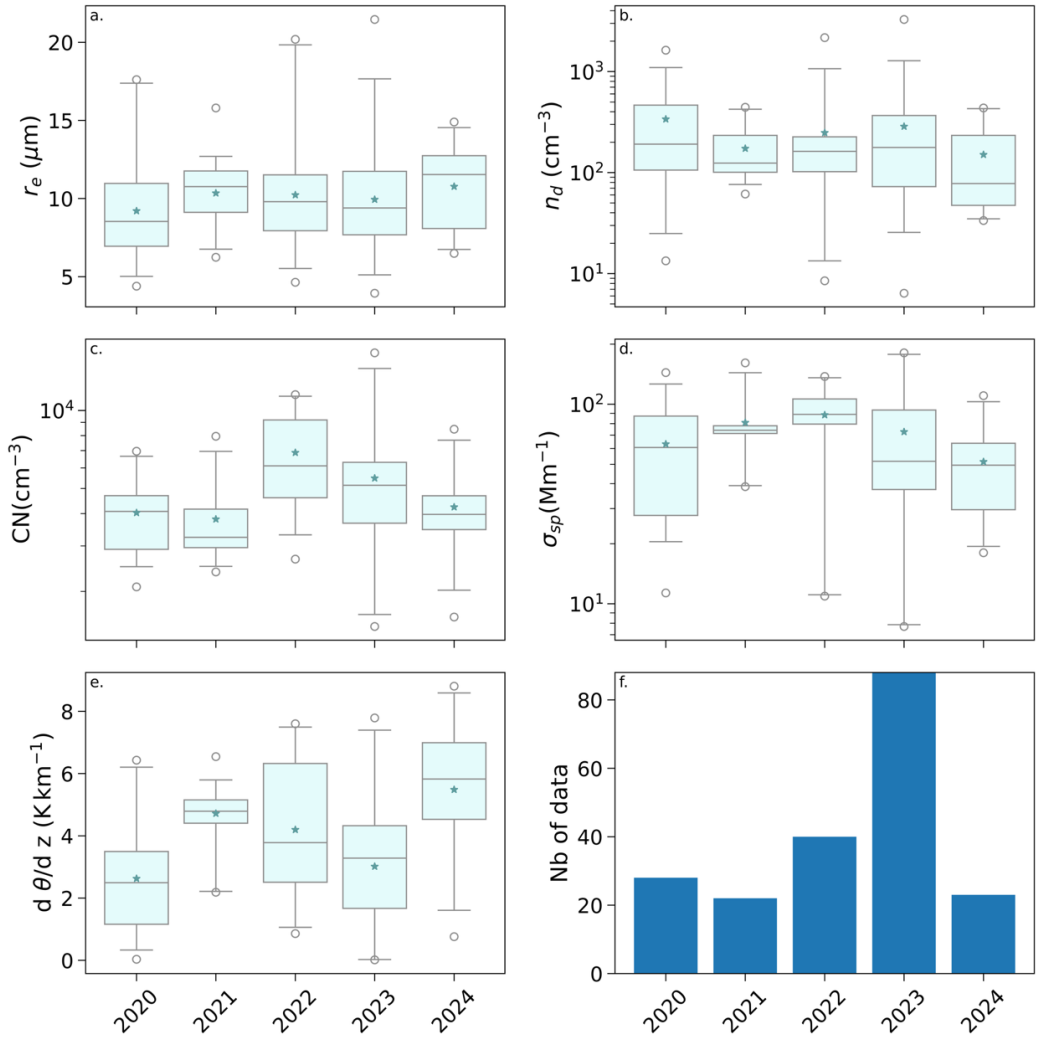


Figure S2 : Interannual variation of (a) cloud droplet effective radius (r_e), (b) cloud droplet number concentration (n_d), (c) particle concentration (CN), (d) dried aerosol light scattering ($\sigma_{sp,525nm}$), (e) potential temperature vertical gradient ($d\theta/dz$), and (f.) the number of observations (Nb of data) over the ATOLL station when all filters described in section 3 are applied. For subfigures a to e, the box represents the interquartile range (25th–75th percentiles), with the median indicated by a horizontal line and the mean by the star. Whiskers extend to the 1st and 99th percentiles and outliers of the whiskers are shown as individual points.

S2 Sensitivity analysis

A sensitivity analysis was performed by randomly excluding 25% of the final dataset 1,000 times and recalculating S_n and S_{re} for each realization. The resulting probability density functions (PDFs) of S_n and S_{re} for both low and high LWP ranges are shown in Figure R1.

For Sre, the PDFs are centred at 0.12 and 0.08 for the low and high LWP ranges, respectively, which are identical to the values retrieved from the complete dataset. These results indicate that the retrieved Sre values are only weakly affected by the random removal of one quarter of the data, demonstrating the robustness of the analysis despite the limited dataset. Similar conclusion can be drawn for Sn. The PDFs are centred at 0.41 and 0.33 for the low and high LWP ranges, respectively, whereas the values obtained from the complete dataset are 0.40 and 0.33. This further supports the robustness of the estimated Sn values with respect to random reductions in the dataset.

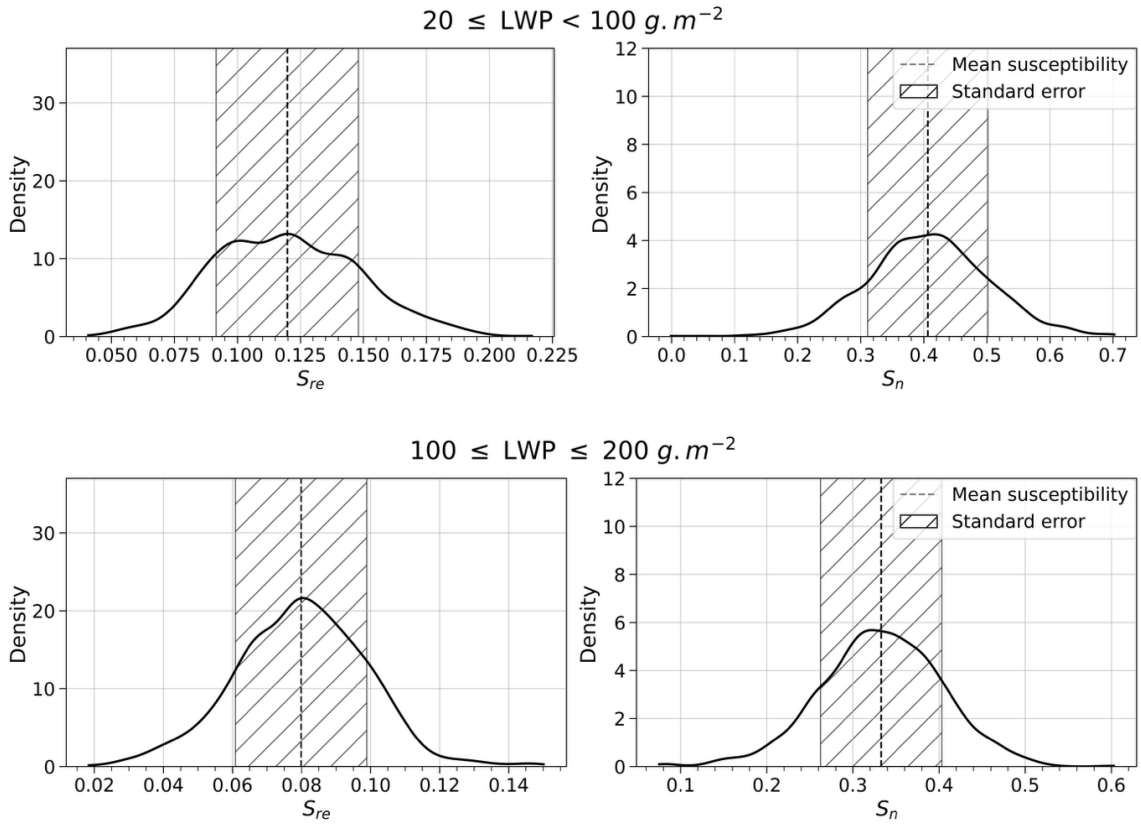


Figure S3: **Probability density functions of S_n and S_{re} obtained from 1,000 random realizations in which the final dataset was artificially reduced by 25%. S_n and S_{re} were recalculated for each realization.**