Supplement of

Long-term performance of the Vaisala CL61 ceilometer for atmospheric profiling

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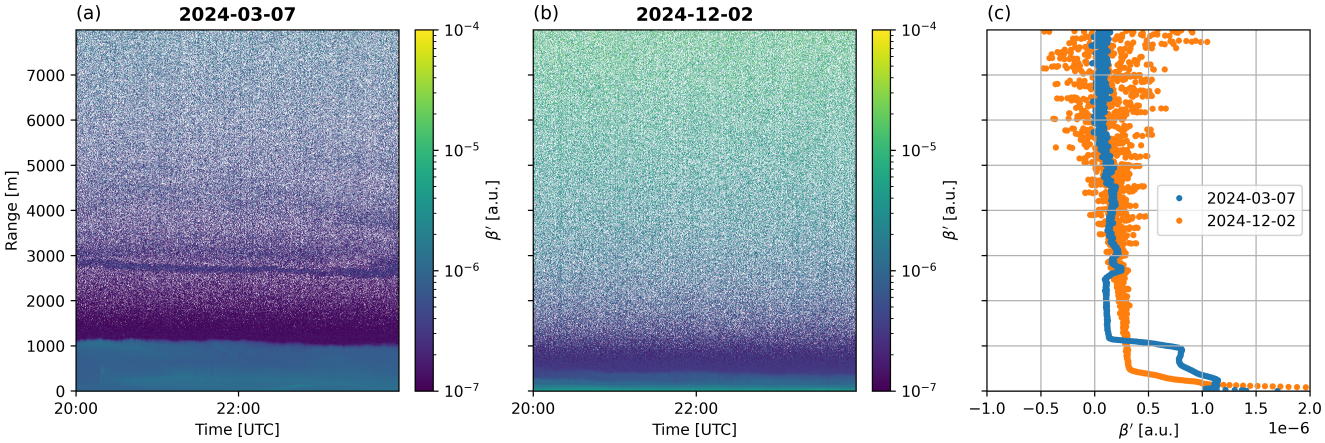

Figure S1. Study case on the effect of laser power percentage on the β' in Lindenberg. a) on 2024-03-07 20:00 to 23:00 UTC with laser power percentage at 80%, b) on 2024-12-02 20:00 to 23:00 UTC with laser power percentage at 10% and c) Their average profiles 20:00 to 23:00 UTC.

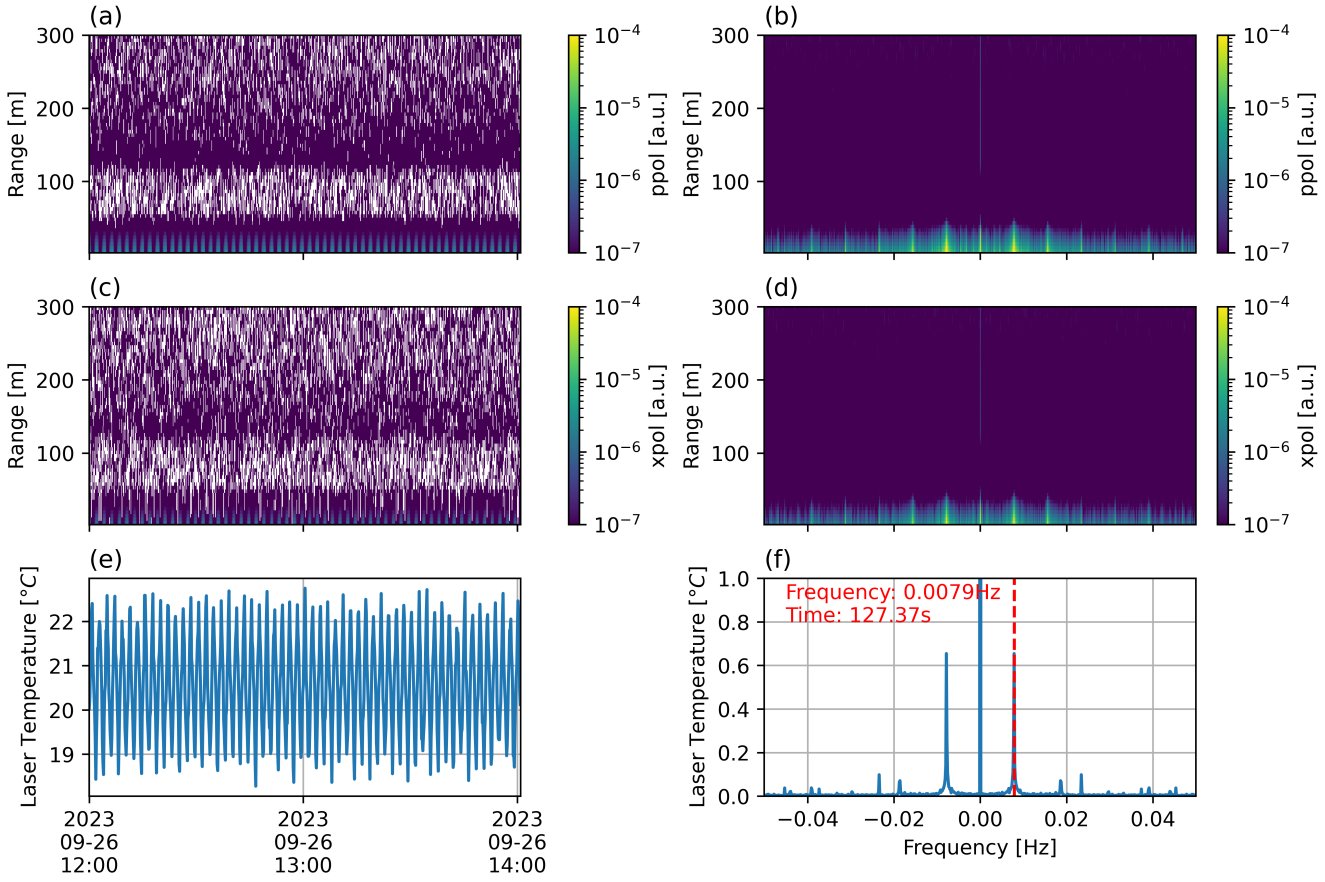

Figure S2. Data from Kenttärova 2023-09-26 a) ppol, b) Fourier transform in the time domain of ppol c) xpol, d) Fourier transform in the time domain of xpol, e) laser temperature, f) Fourier transform in the time domain of laser temperature.

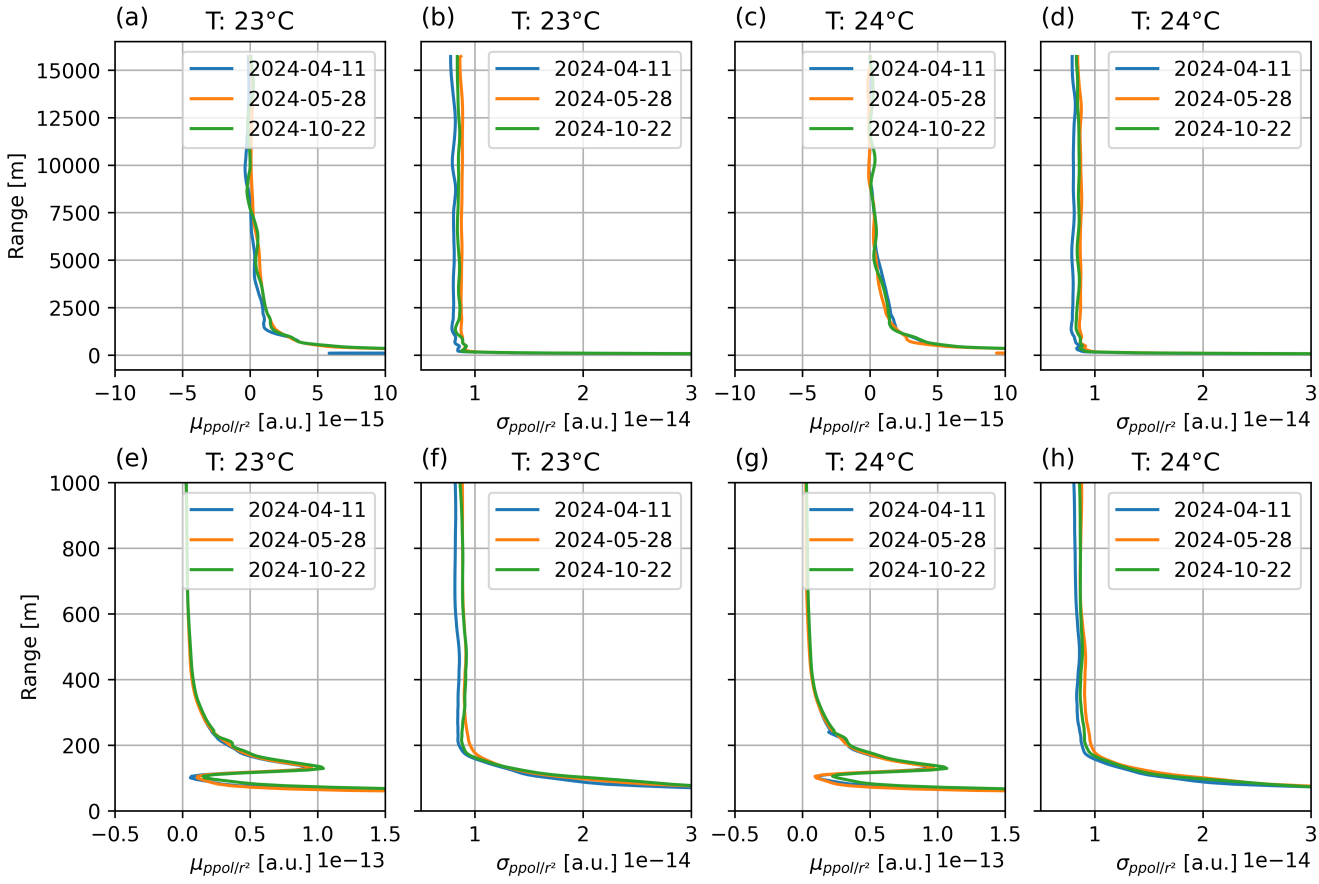

Figure S3. Calibration profiles in Vehmasmäki at 23°C and 24°C, recorded at three different time points over a six-month period in 2024.

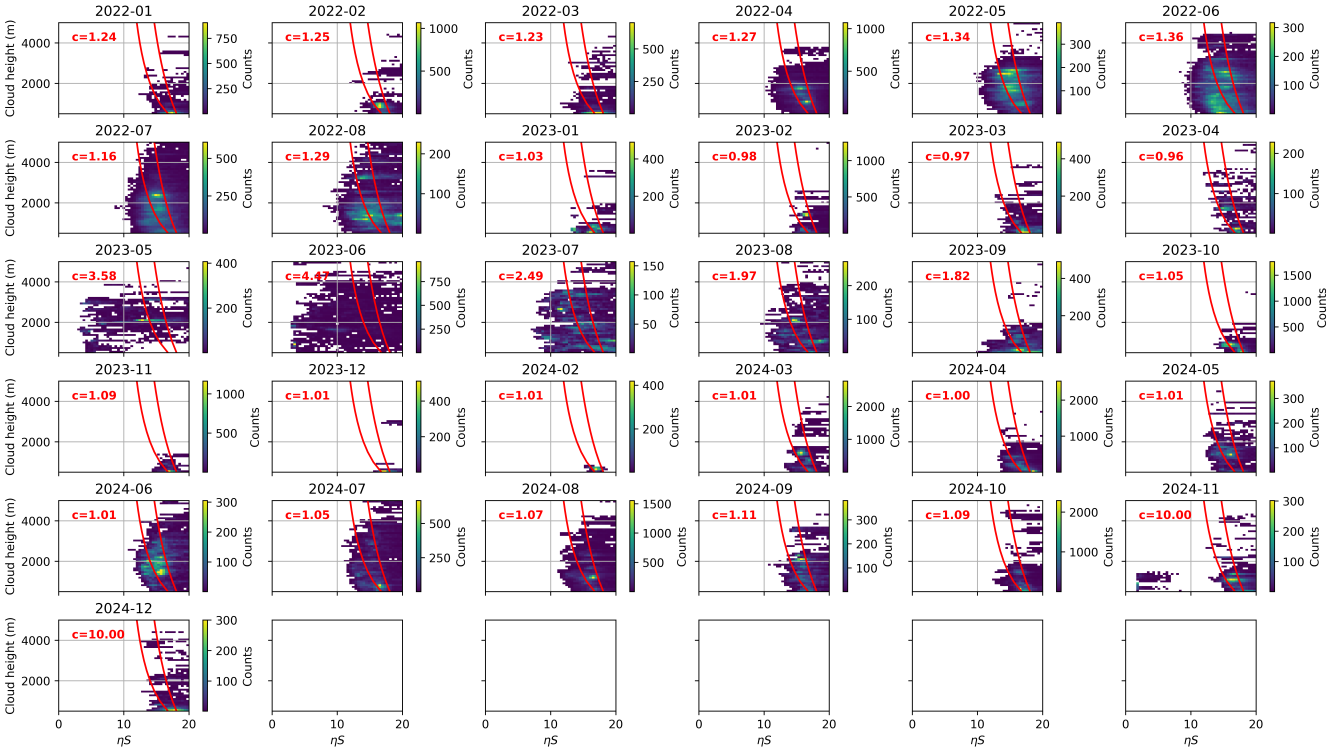

Figure S4. Monthly calibration factor C (in red) obtained from the cloud calibration method on Vehmasmäki CL61 data. The red line represent the theoretical values of ηS for droplet effective diameters 8-20 μm. The shown calibration factor value was applied.

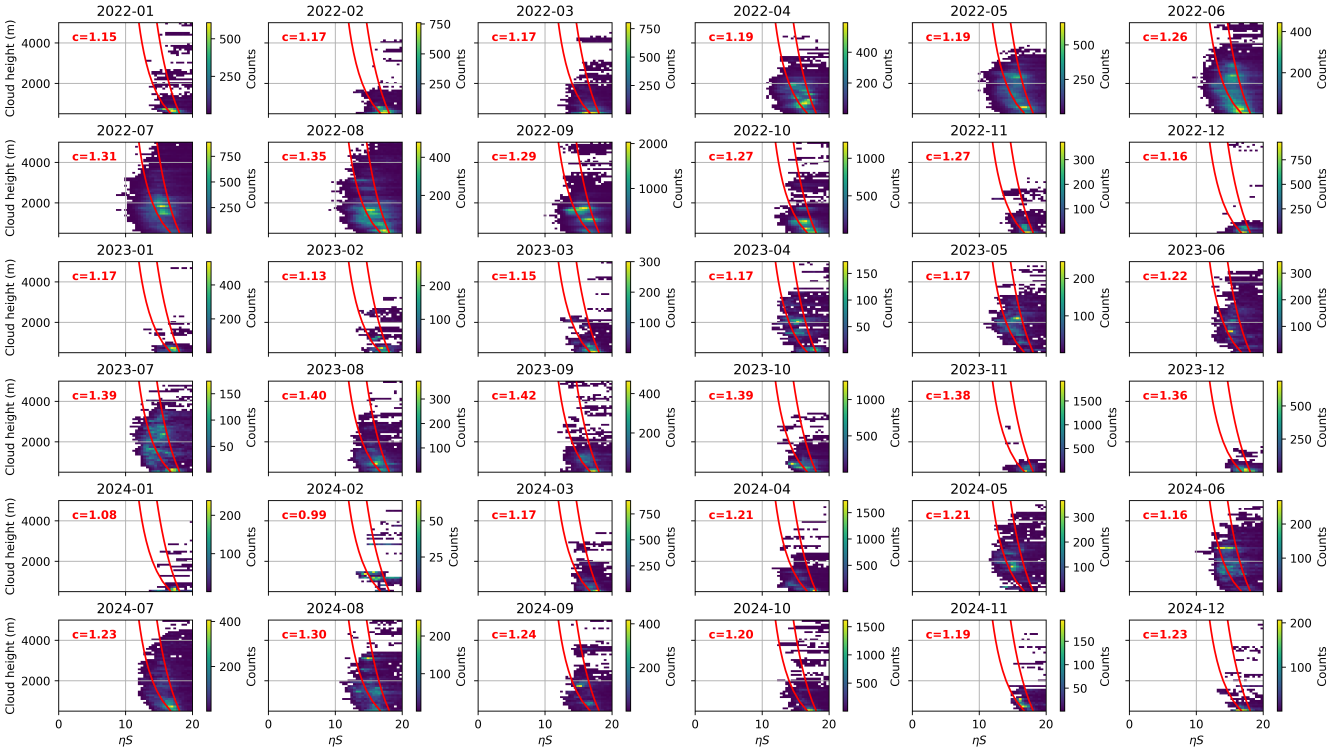

Figure S5. Monthly calibration factor C (in red) obtained from the cloud calibration method on Hyytiala CL61 data. The red line represent the theoretical values of ηS for droplet effective diameters 8-20 μm. The shown calibration factor value was applied.

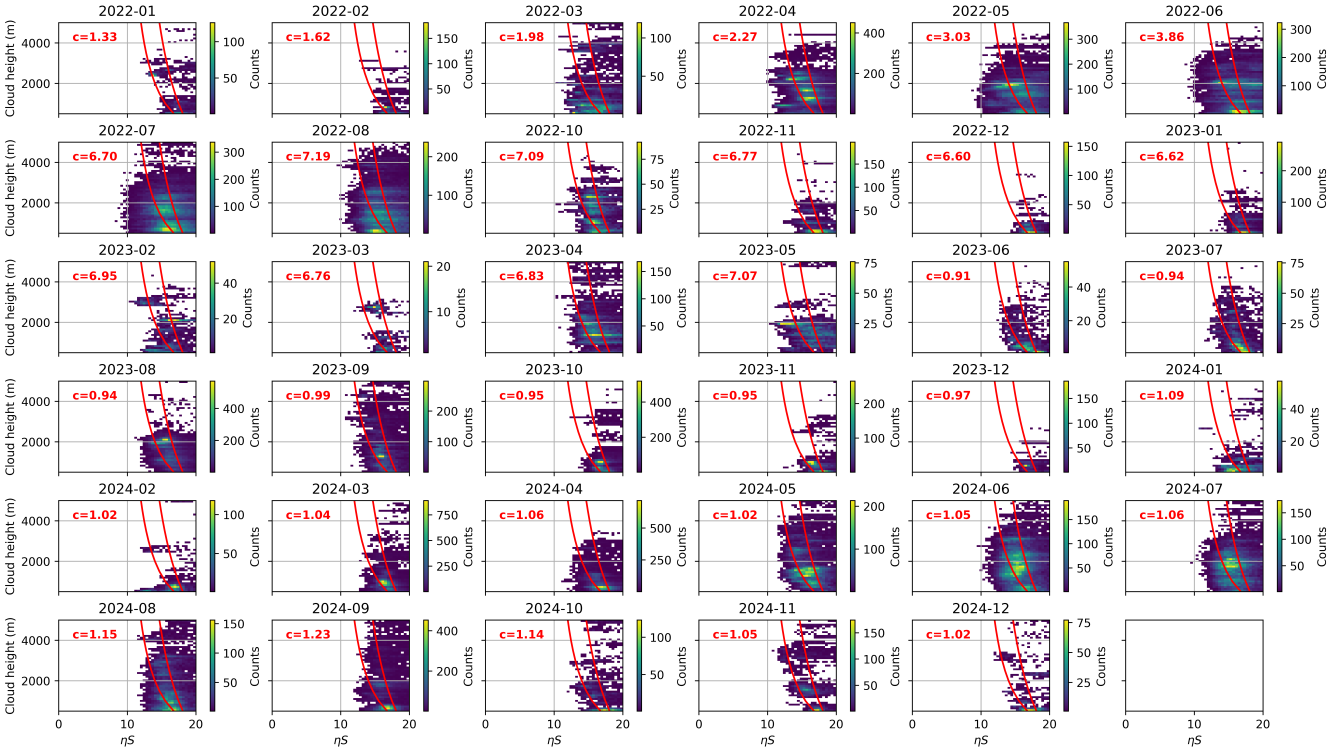

Figure S6. Monthly calibration factor C (in red) obtained from the cloud calibration method on Kenttärova CL61 data. The red line represent the theoretical values of ηS for droplet effective diameters 8-20 μm. The shown calibration factor value was applied.

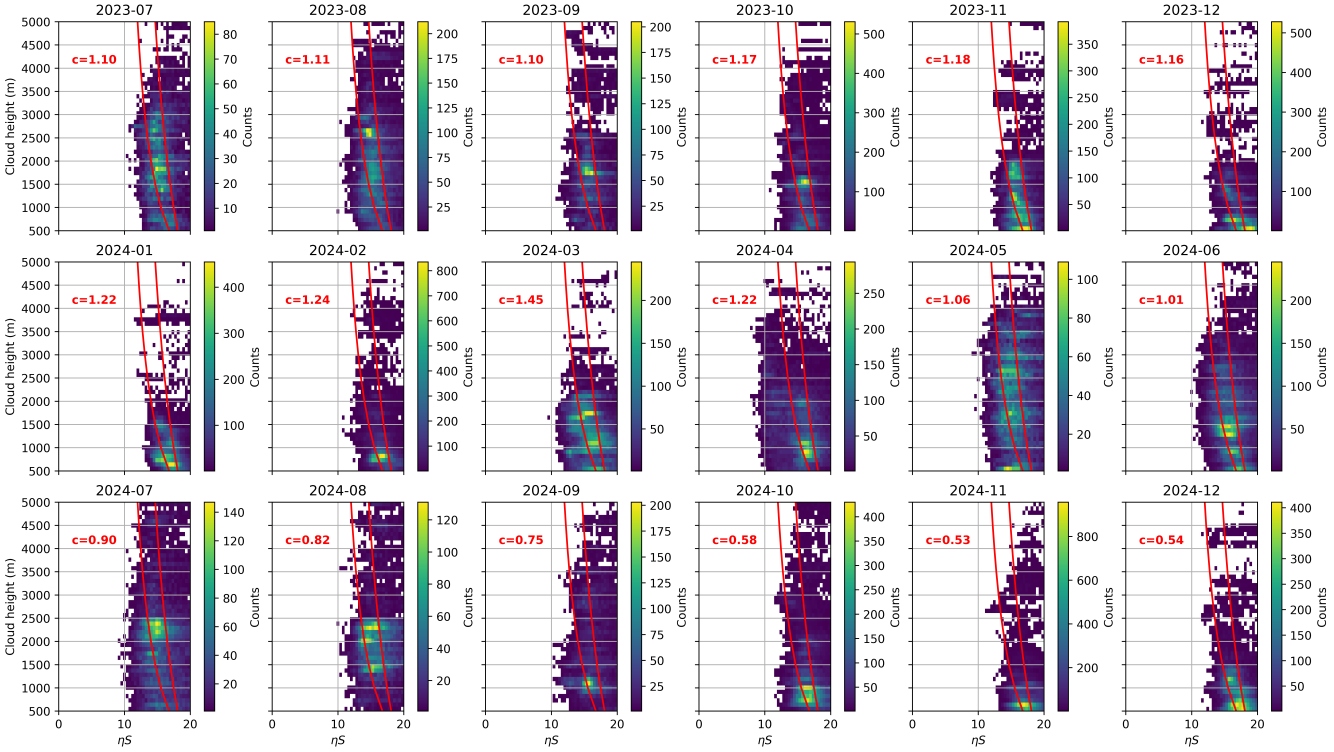

Figure S7. Monthly calibration factor C (in red) obtained from the cloud calibration method on Lindenberg CL61 data. The red line represent the theoretical values of ηS for droplet effective diameters 8-20 μm. The shown calibration factor value was applied.

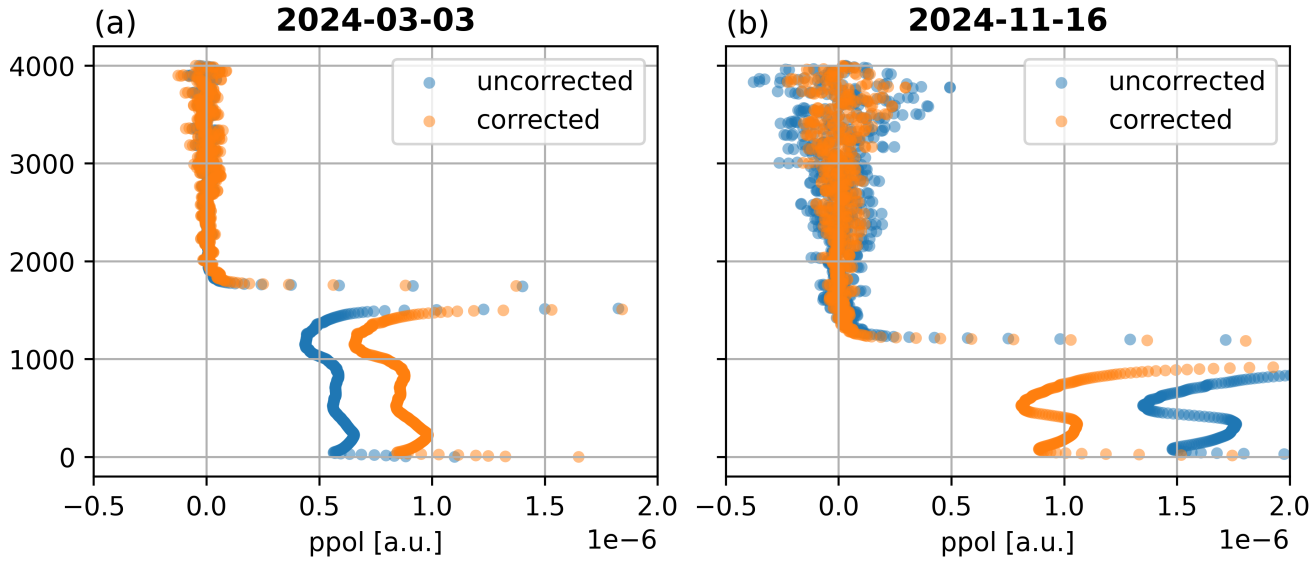

Figure S8. Averaged backscatter profile from Lindenberg a) 2024-03-03 16:30 to 17:00 at laser power 80%, b) 2024-11-16 16:30 to 17:00 at laser power 10%,

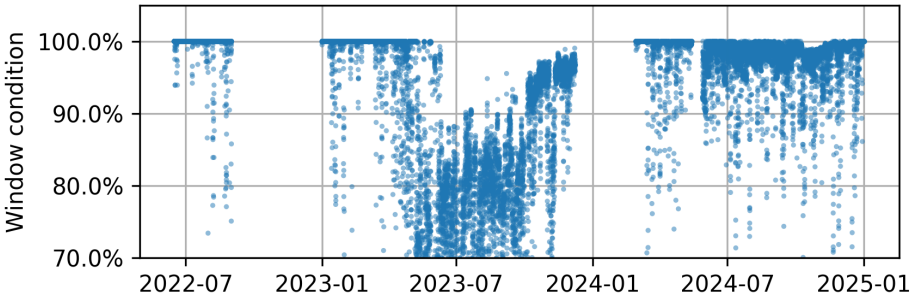

Figure S9. Window condition in Vehmasmäki