Statistically based calibration/validation control of ATLID Level 1 products

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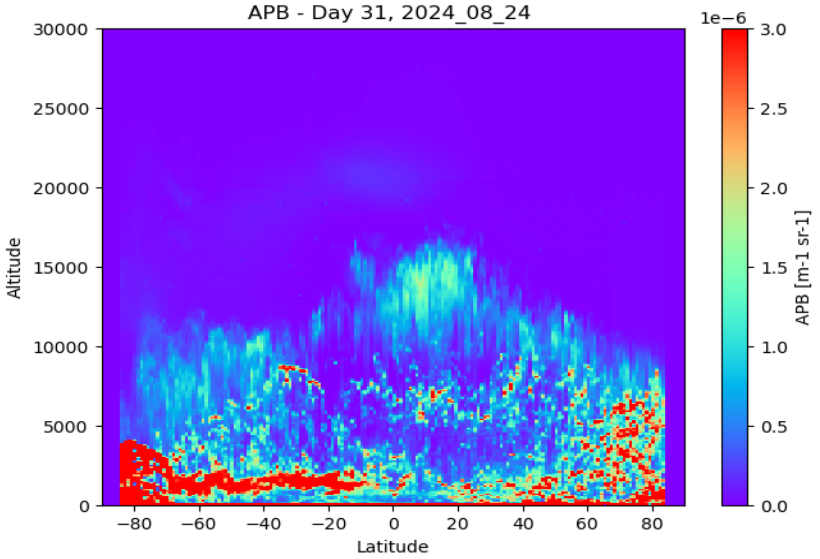
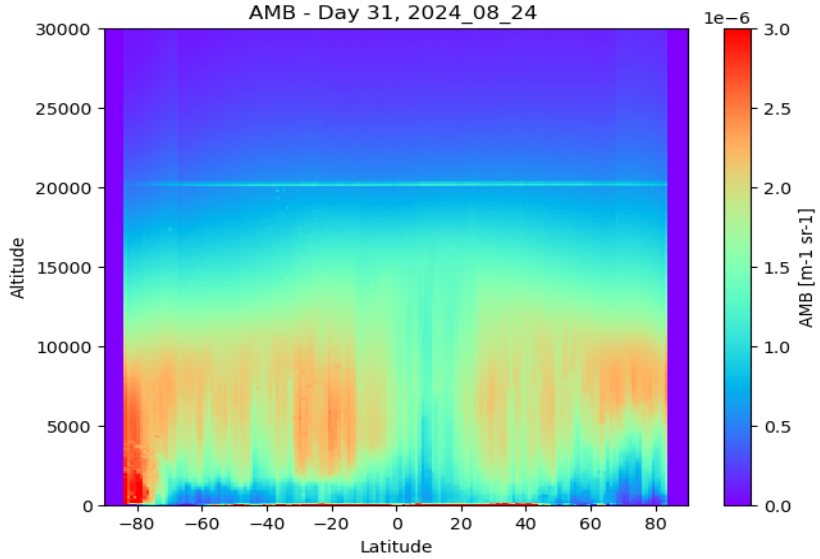
14 – 17 January 2025 | VIRTUAL EVENT

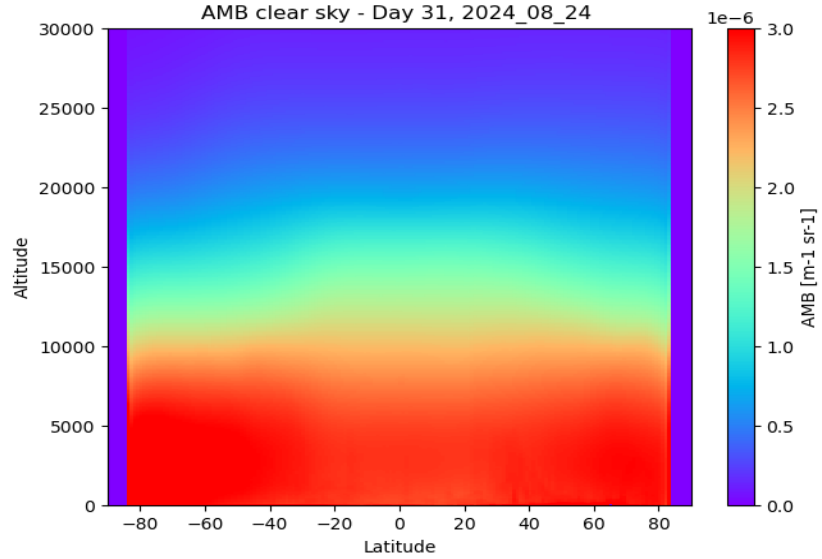
Quality/stability control parameters

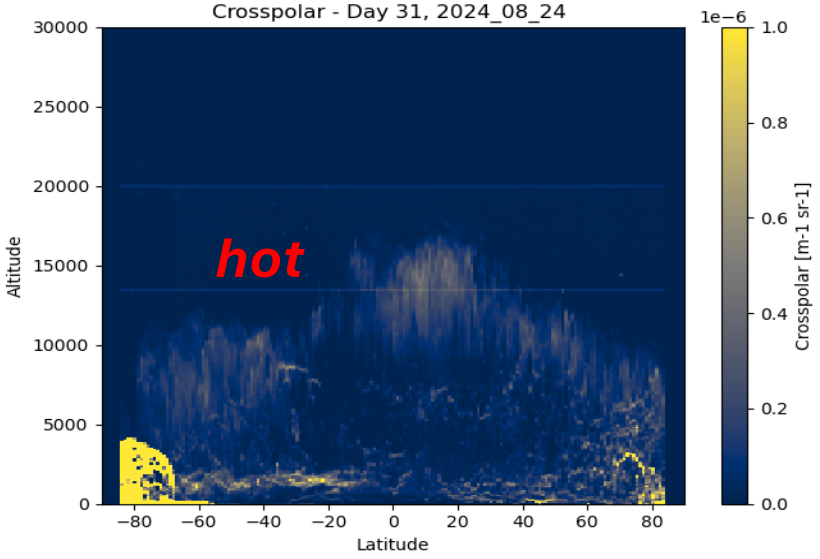
N	Channel/data	Description
1	Mol.	Center values of histograms of radiance reflected from the ocean with T_{surf} = 300±1 K.
2	Part.	
3	Perp.	
4	Mol. day	Center values of histograms of daytime and nighttime stratospheric molecular signal (~35km) or noise (higher altitudes).
5	Part. day	
6	Perp. day	
7	Mol. night	
8	Part. night	
9	Perp. night	
10	K_{corr}, SR histo	Weighted average of the correlation coefficient or deviation for the clustered scattering ratio histograms w.r.t. the reference or the first day
11	R.M.S., SR histo	

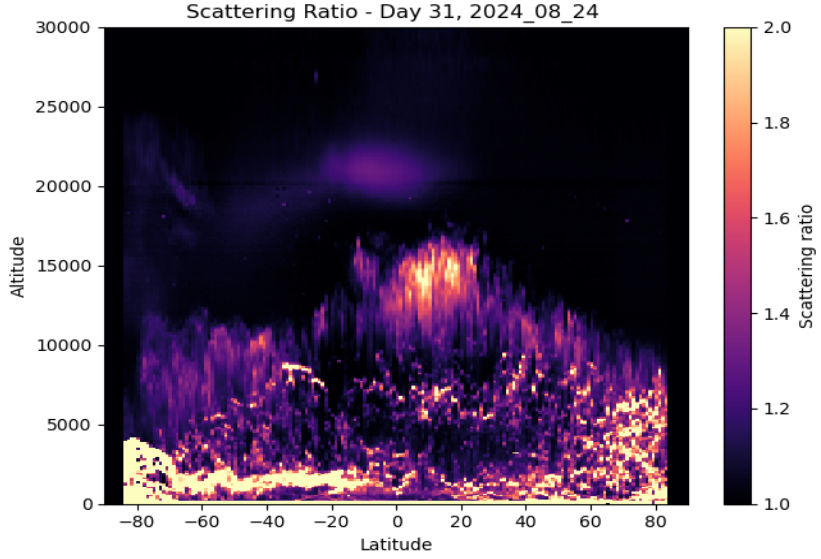
Lat/alt daily files, hot/cold pixels

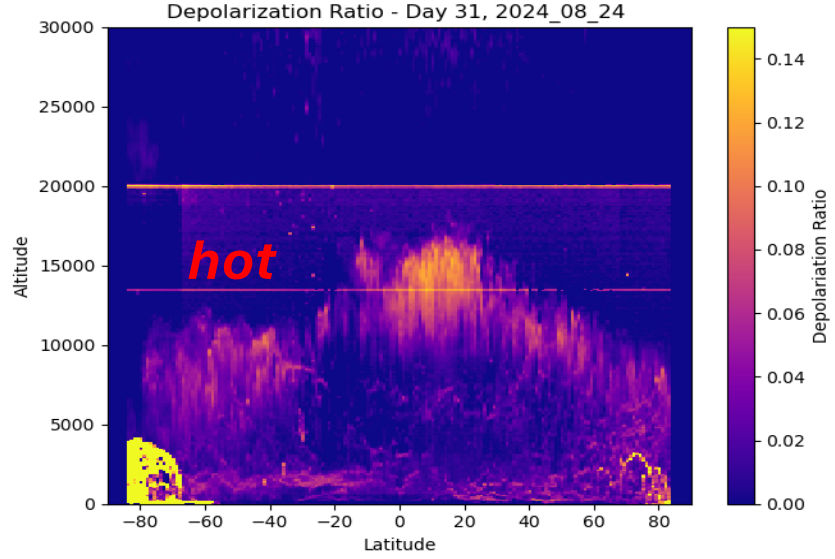












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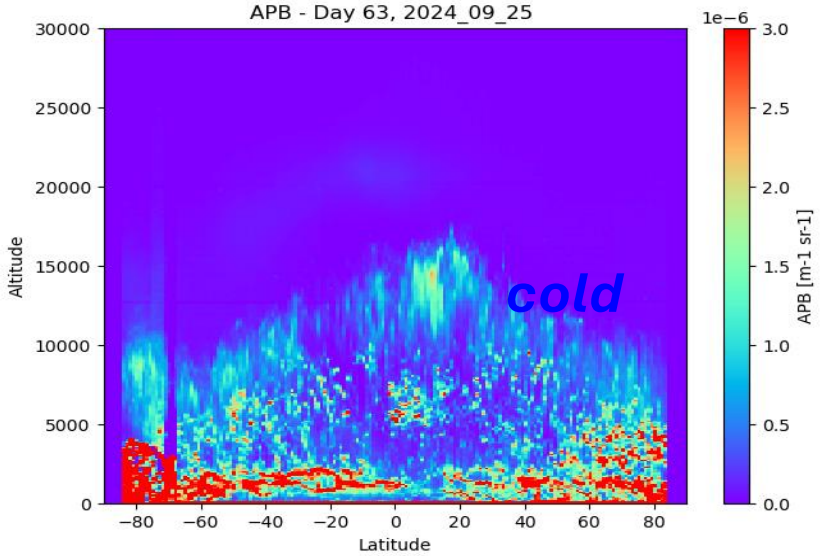

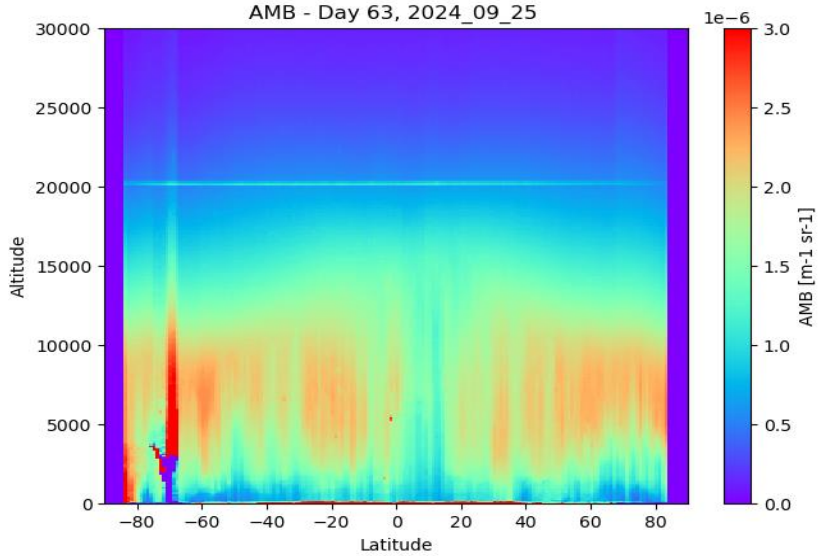

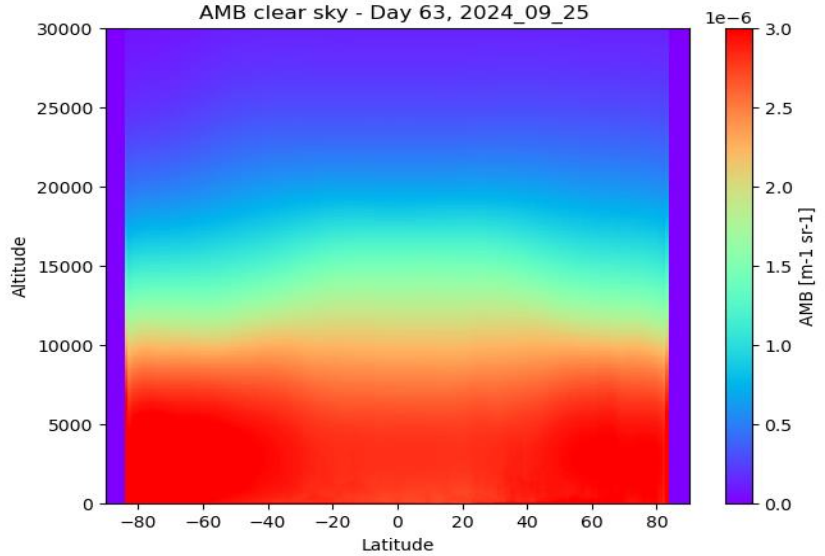

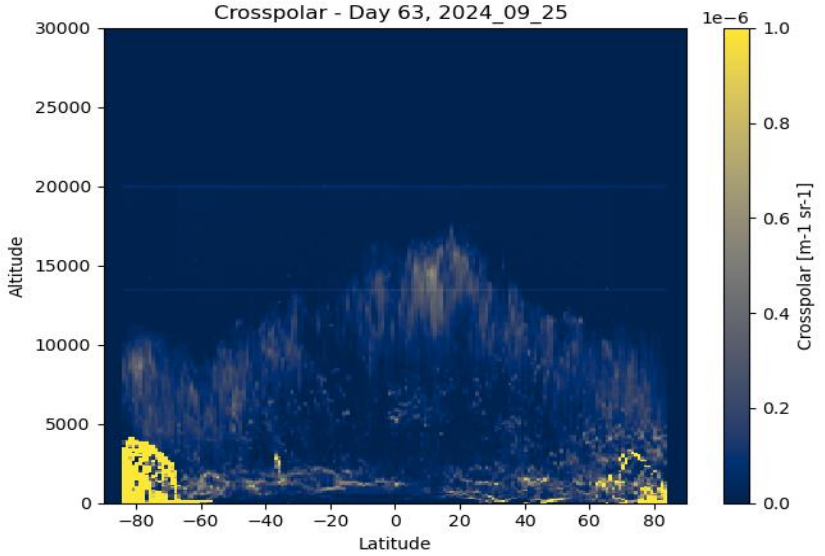

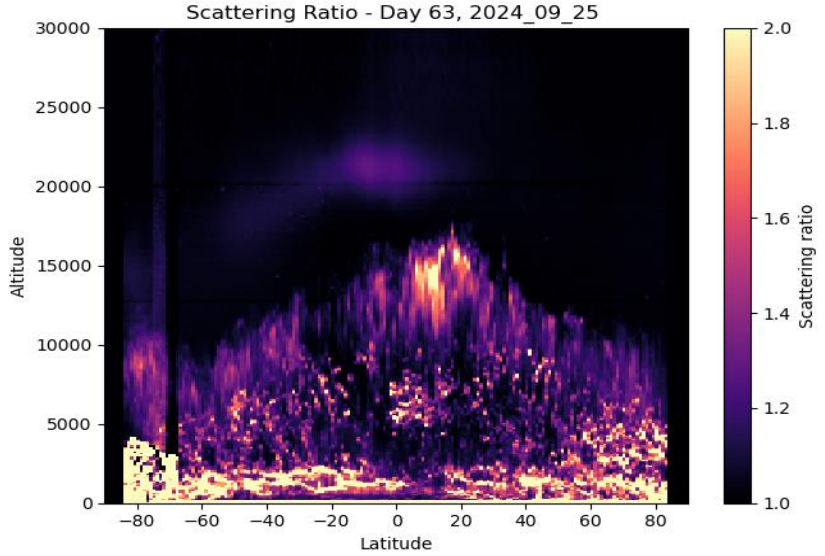

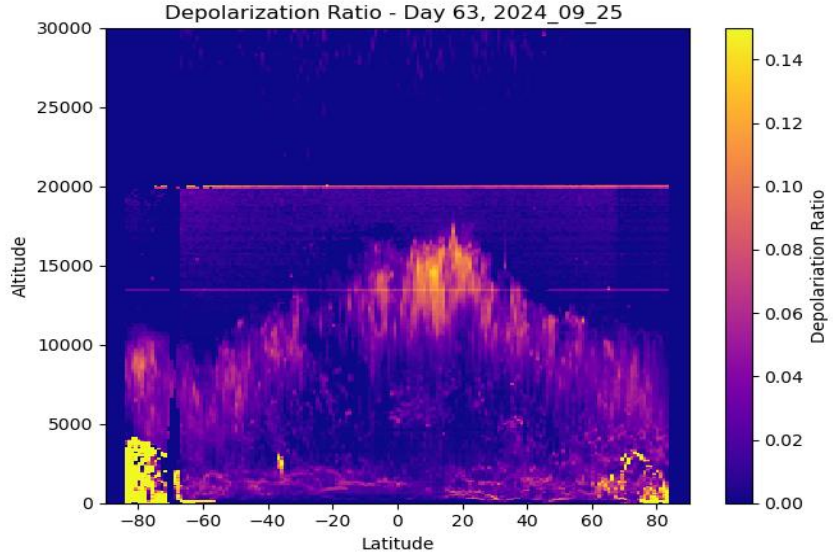

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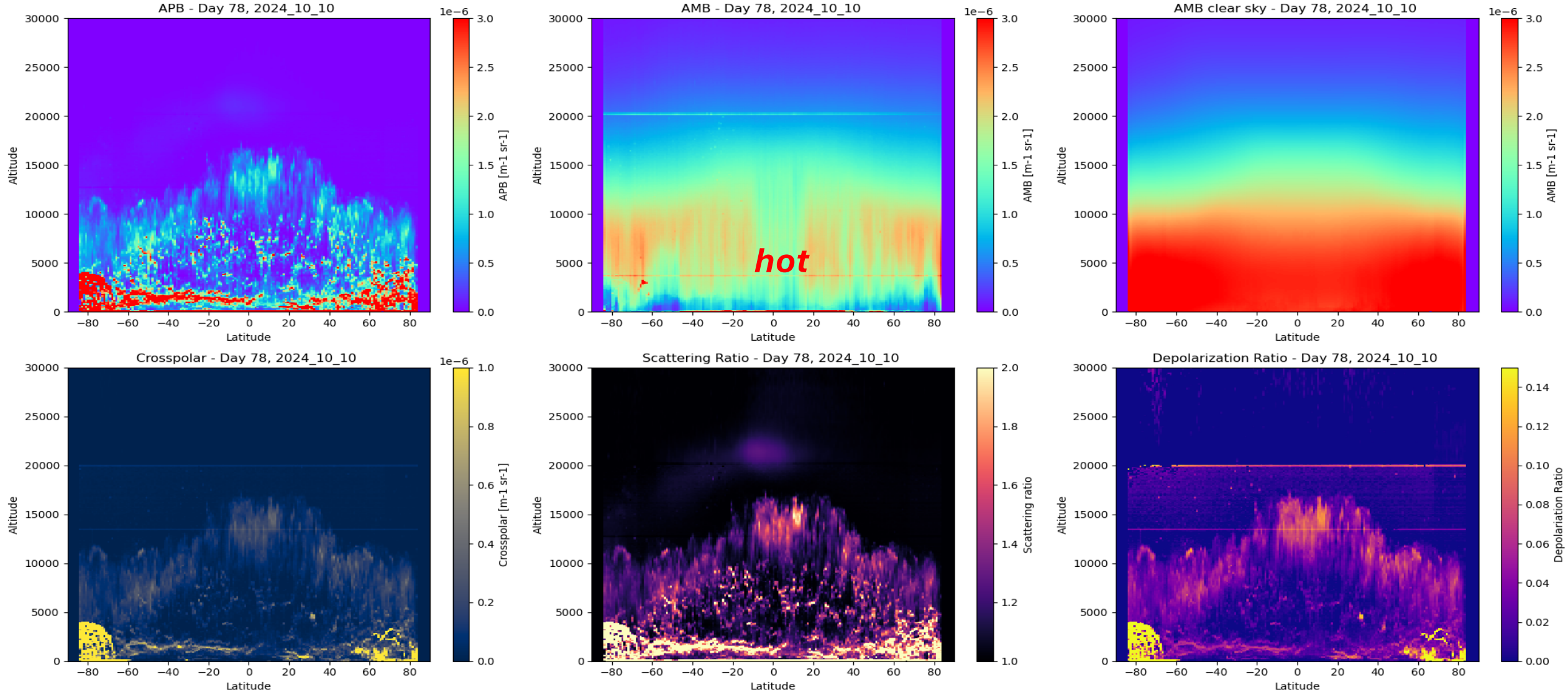

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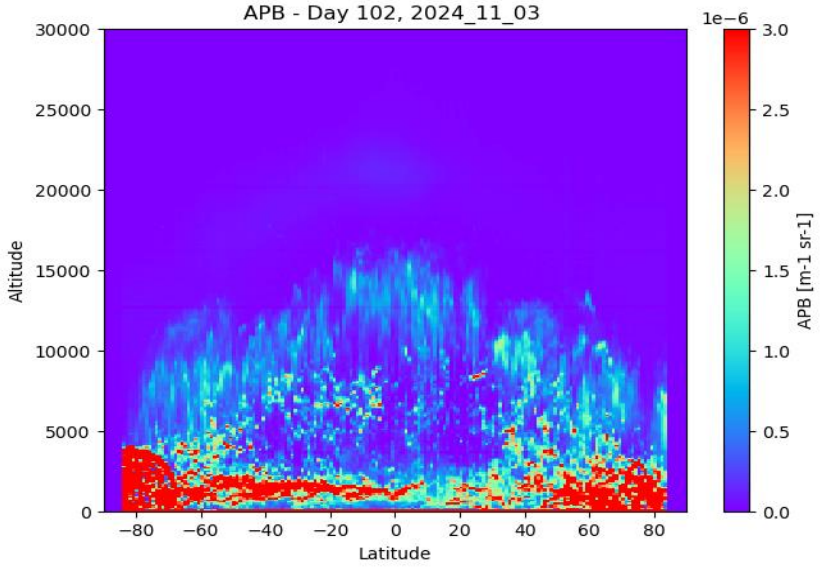

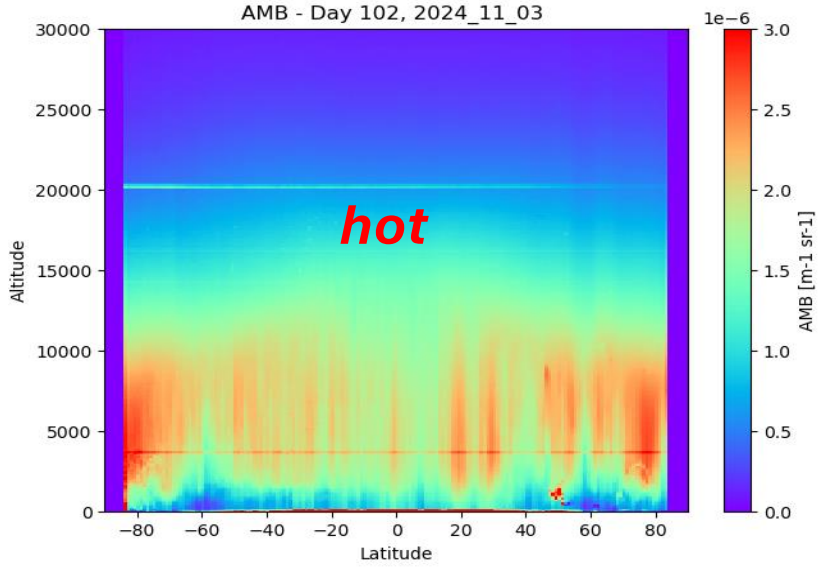

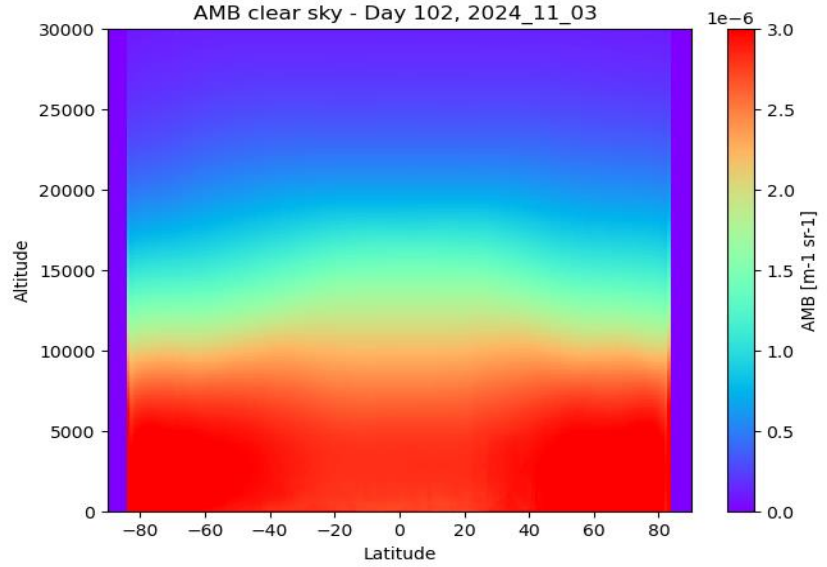

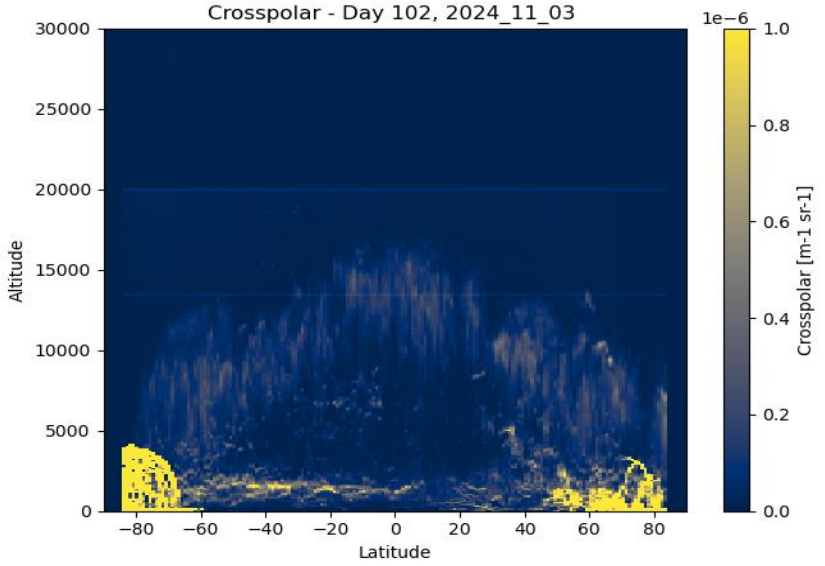

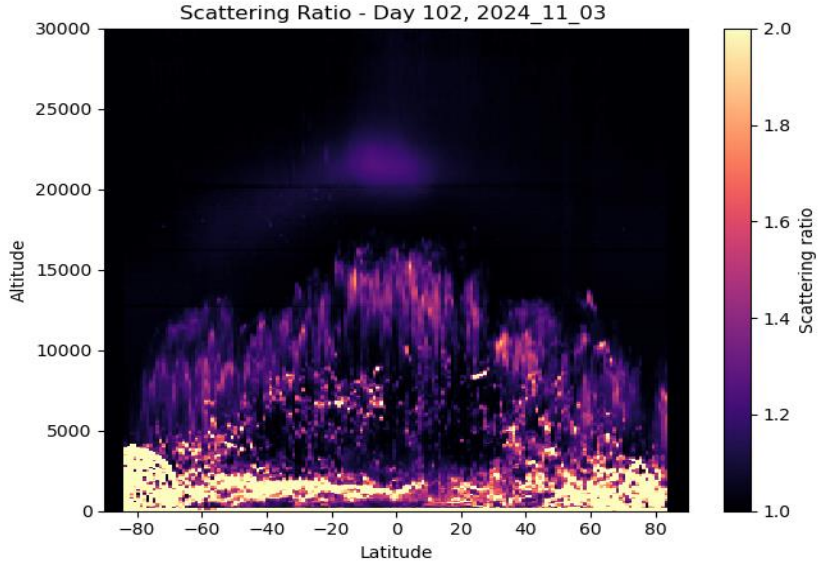

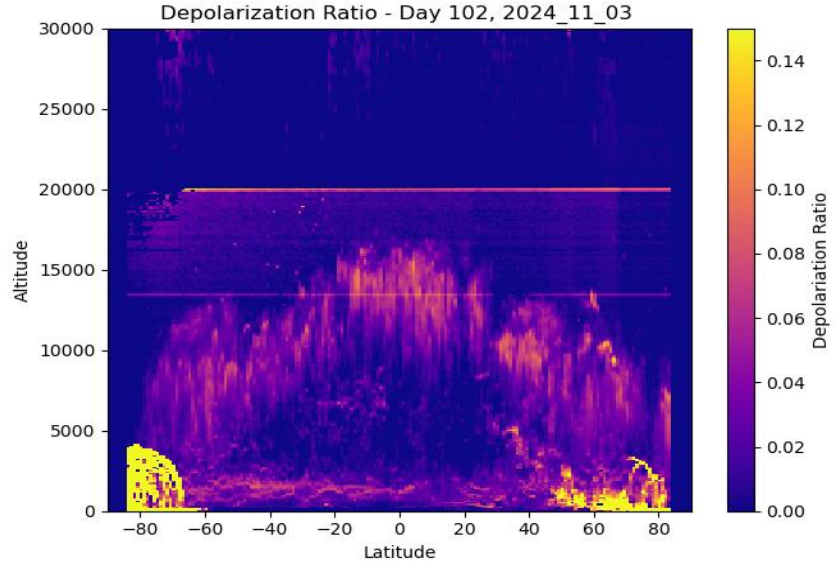

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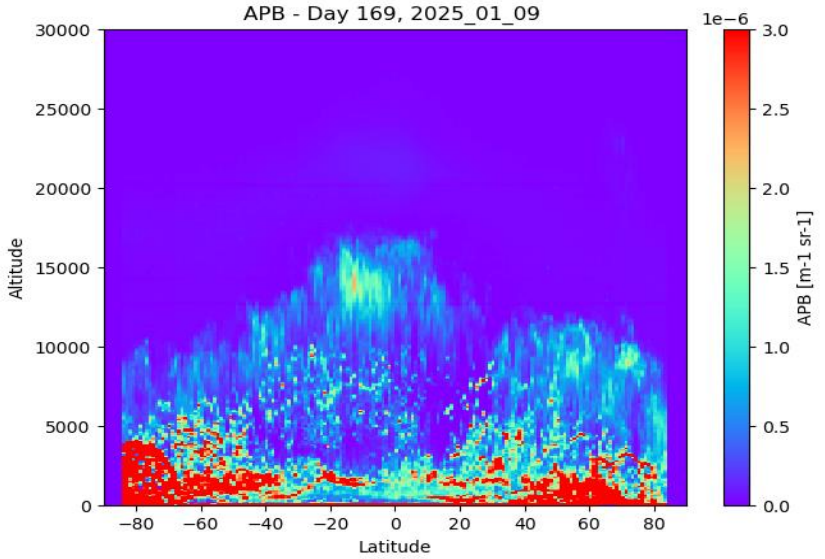
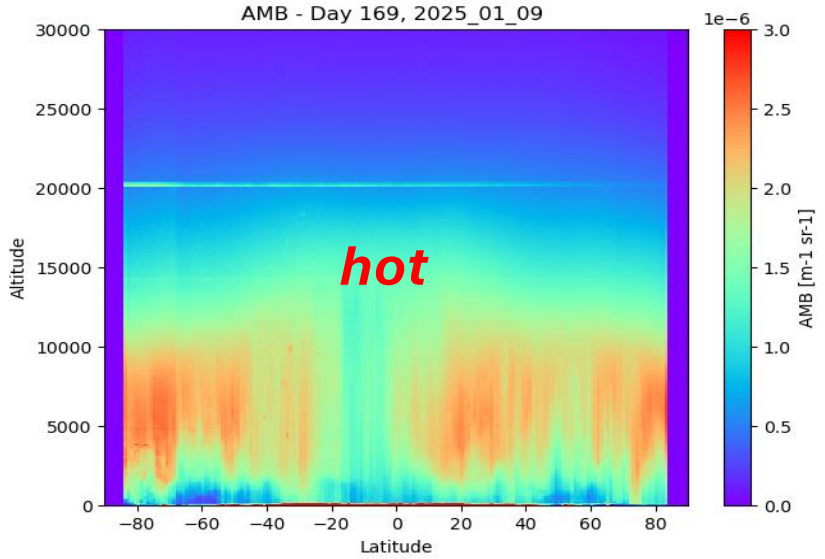
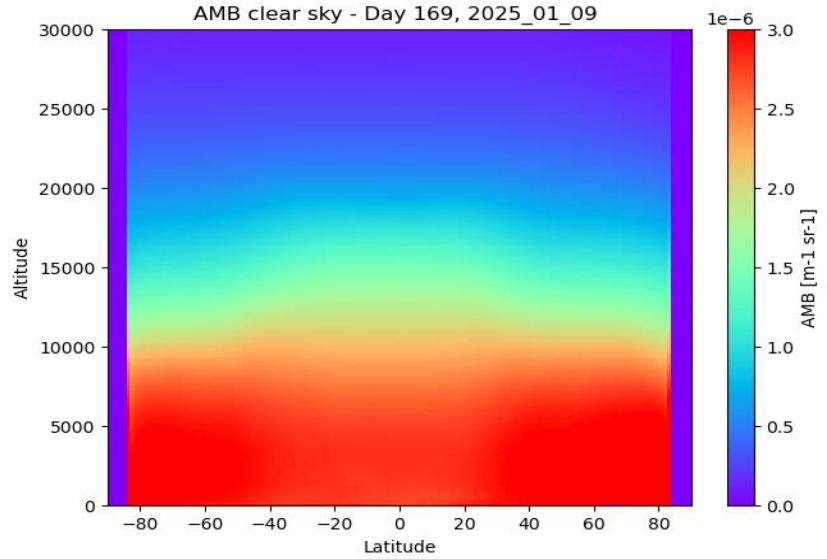
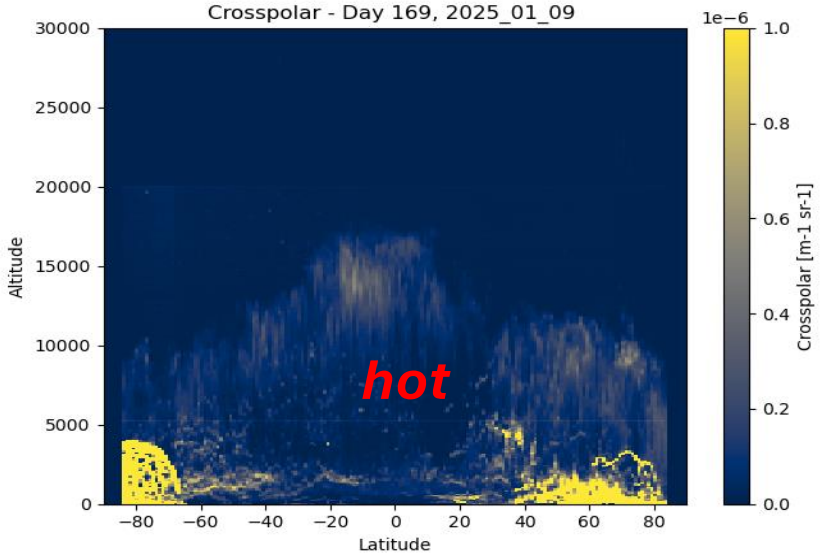
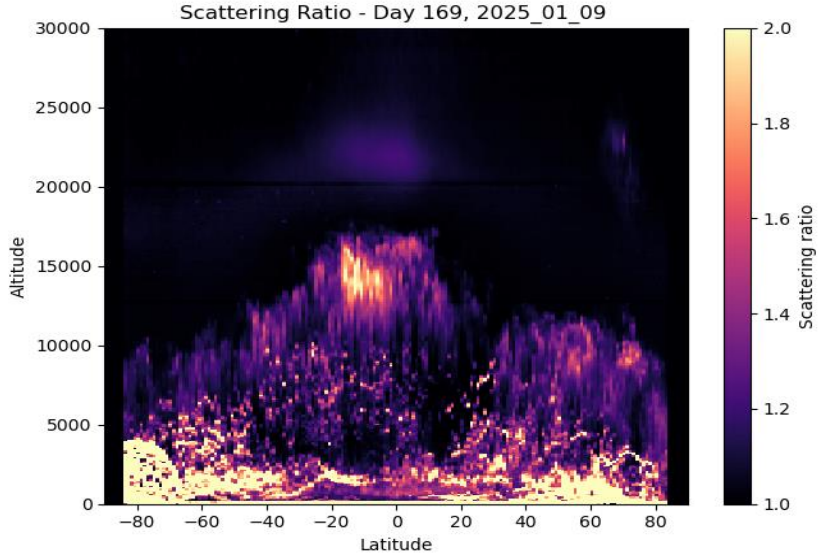
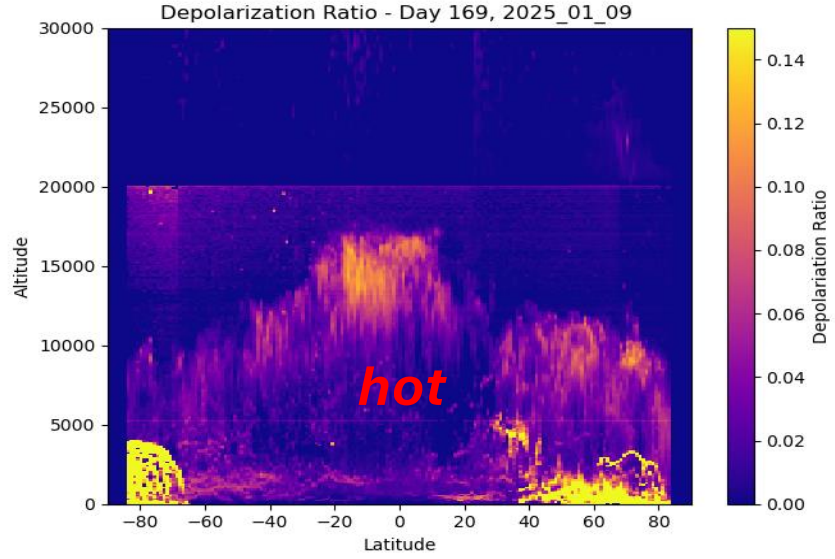




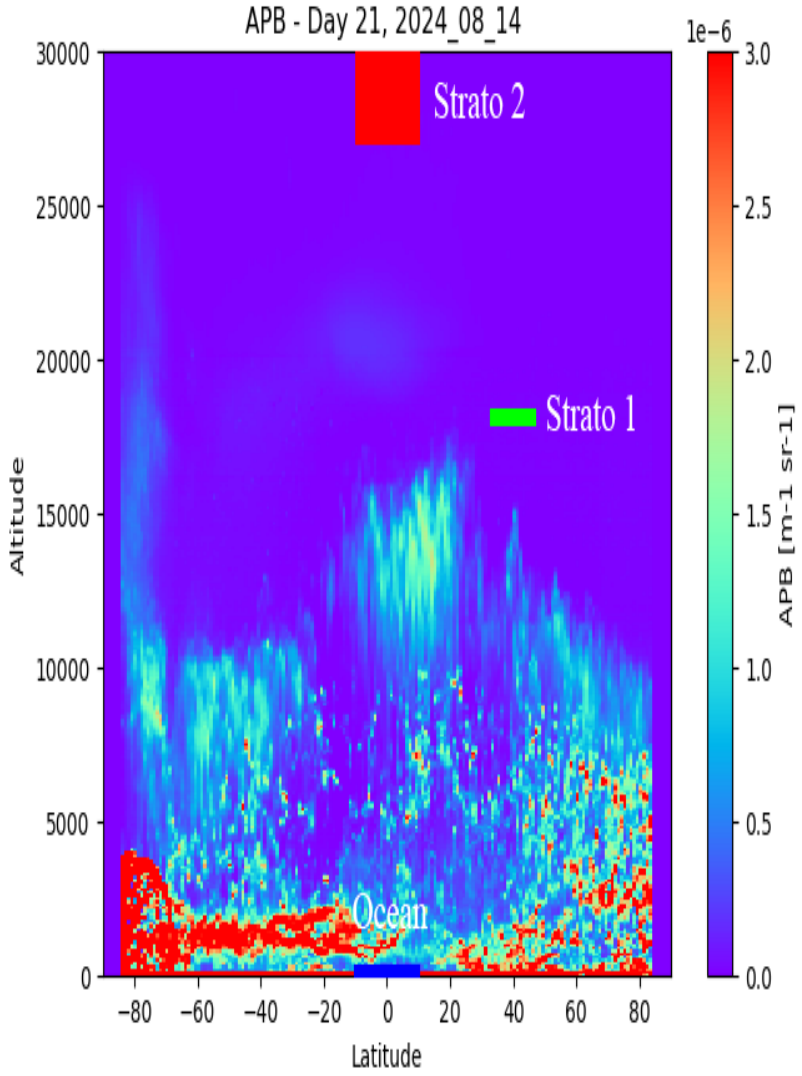


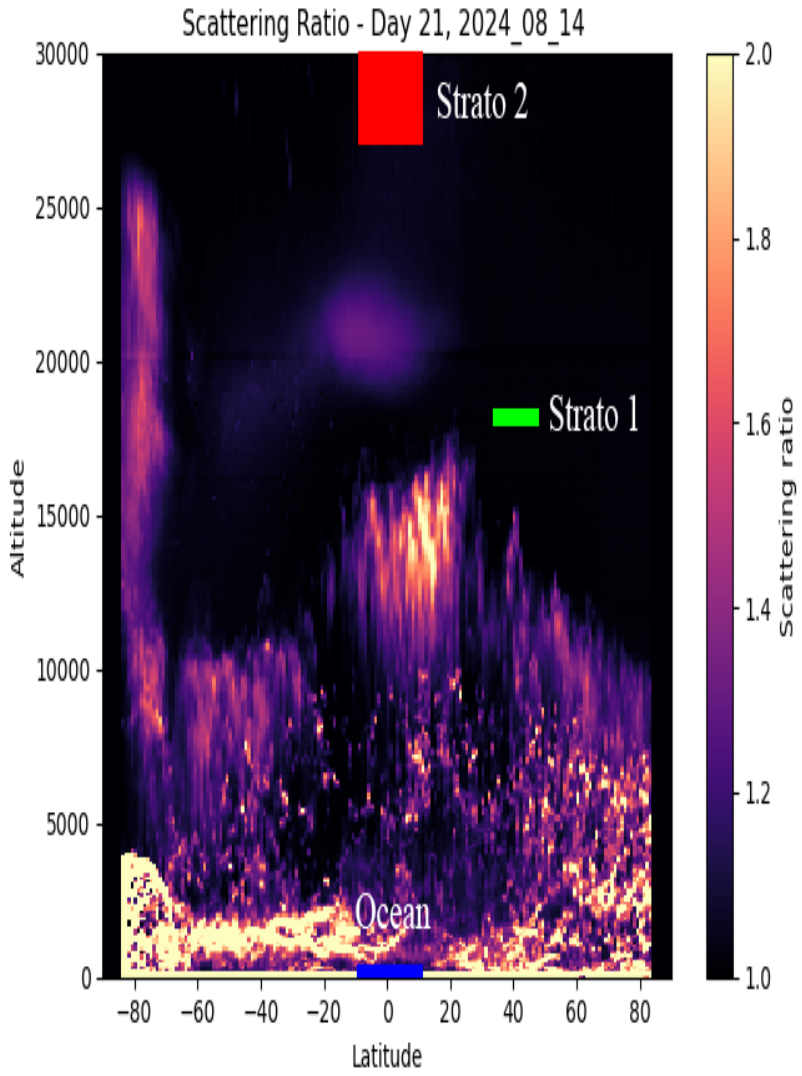


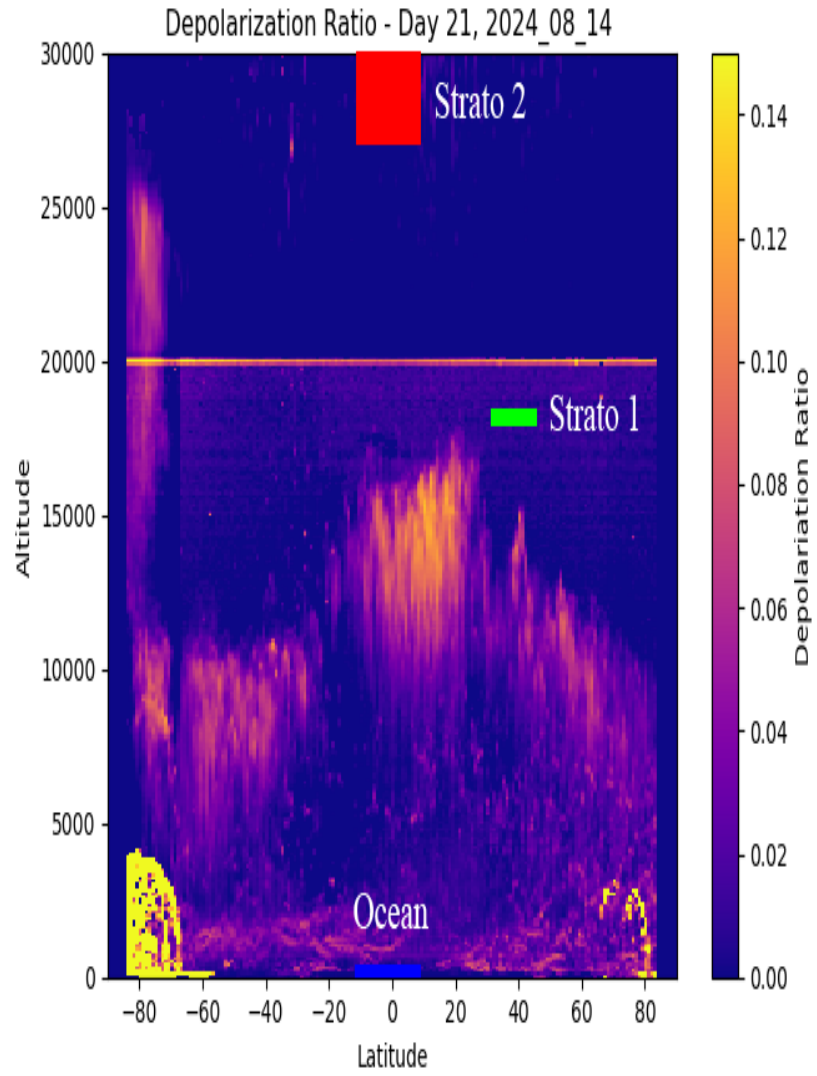




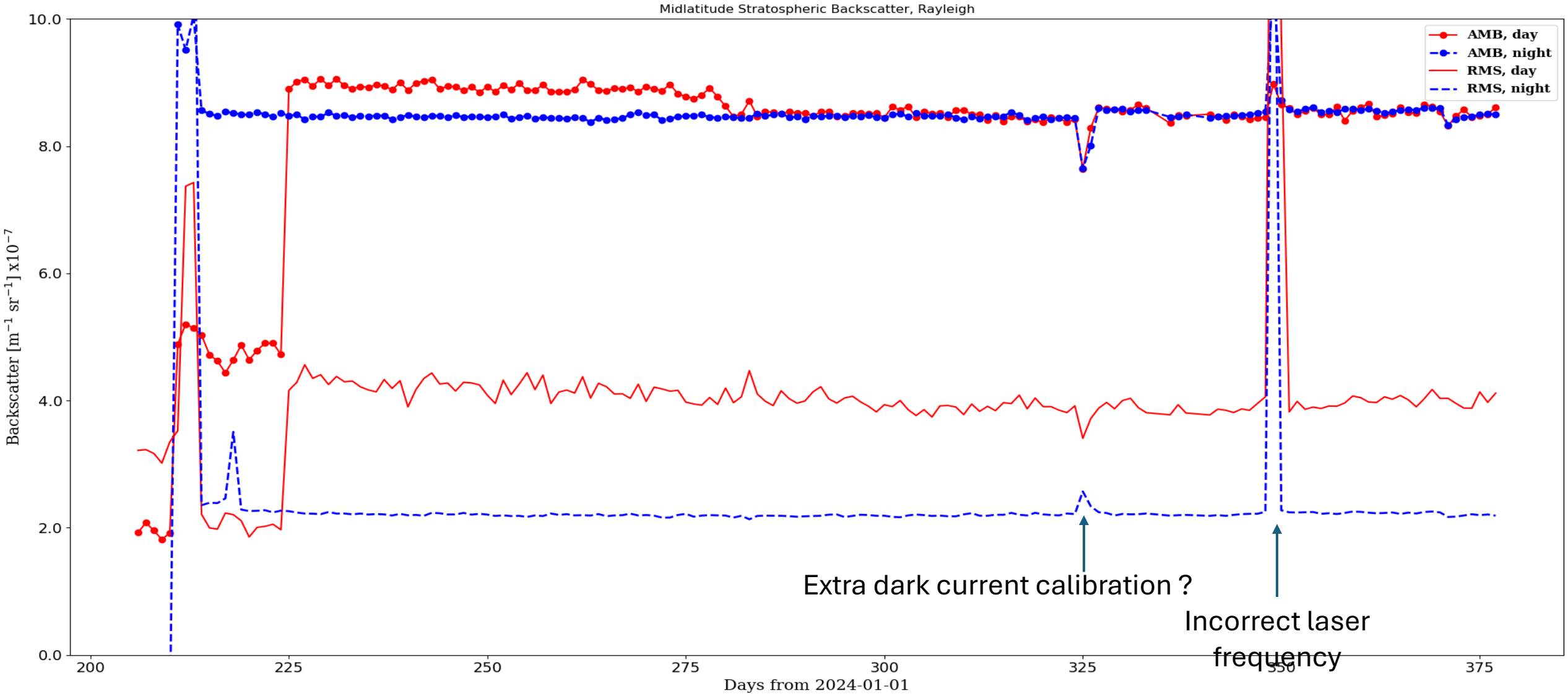
Choosing the reference zones



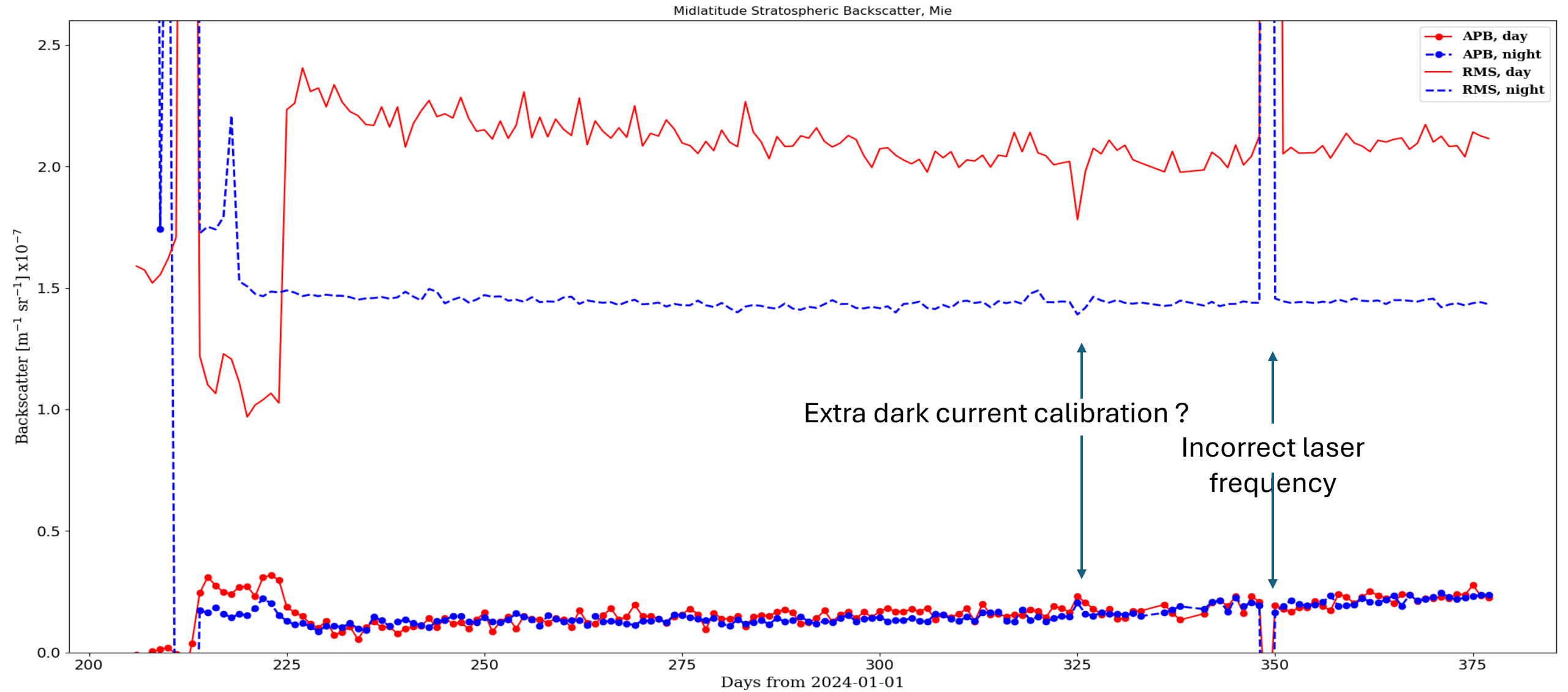




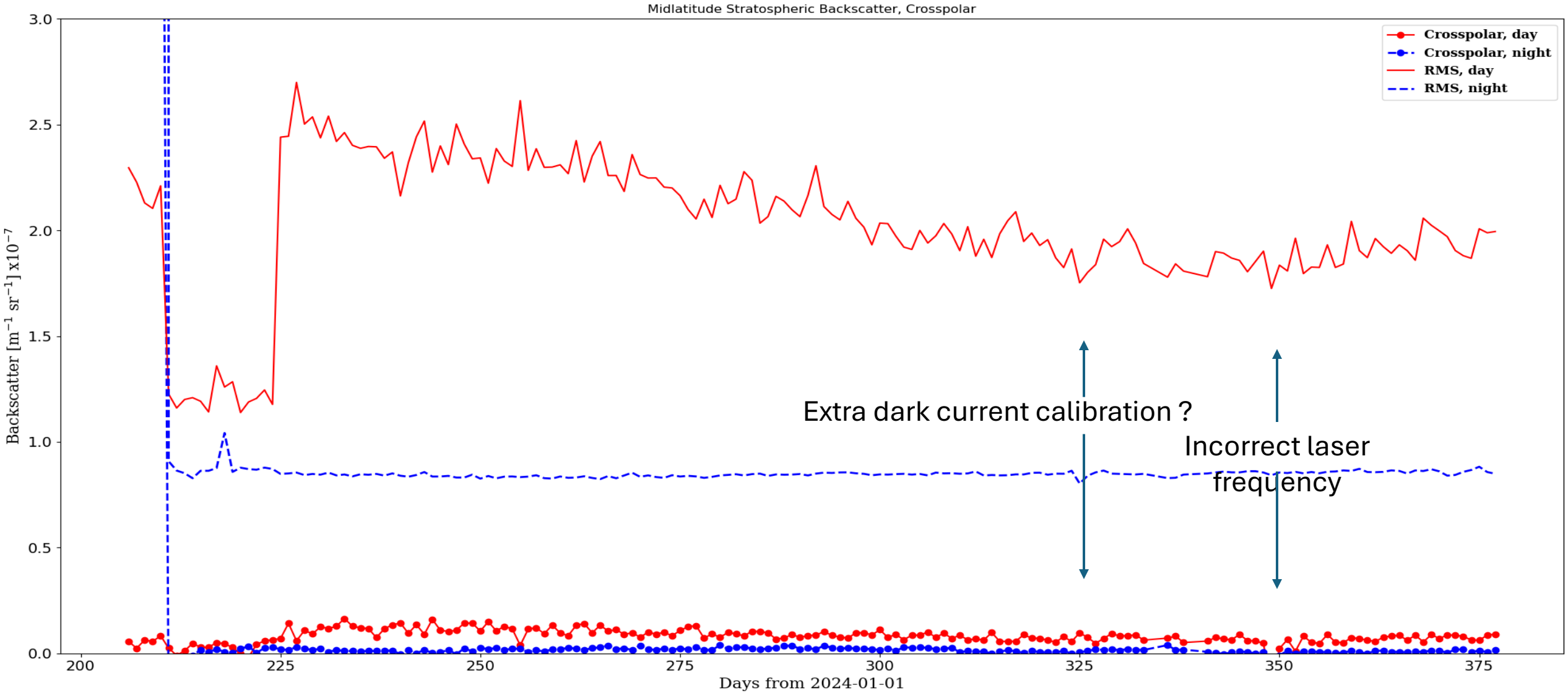
Results: Strato1 18km, Rayleigh



Results: Strato1 18km, Mie



Results: Strato1 18km, cross-polar



Results: clear-sky ocean surface backscatter

Conclusions

- latitudinal/altitudinal time series continue to be useful (the updates are in blue):
  - 2024/08/24 – hot pixel in cross-polar channel near 14km – persists
  - 2024/09/25 – cold pixel in Mie channel near 13 km – persists
  - 2024/10/10 – 2024/11/06 – warm pixel in Rayleigh channel near 4 km
  - 2024/10/21 – 2024/11/05 – hot pixel in Rayleigh channel near 16 km
  - 2025/01/09 – hot pixel in cross-polar channel near 5km

Indicator's behavior	Expected
• Mean stratospheric signals are quite stable, both daytime and nighttime ones	? ☑
• Seasonal behavior of daytime noise	☑
• High sensitivity of Mie/Rayleigh indicators to laser frequency offset both in the stratosphere and for the ocean surface backscatter.	☑
• Additional dark current calibration of 21/11/24 coincides with a peak in Mie and Rayleigh channel' indicators.	?
• Cross-polar channel indicator did not show sensitivity to these cases.	☑