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Differentiating lightning in winter and summer with characteristics of the wind field and mass field

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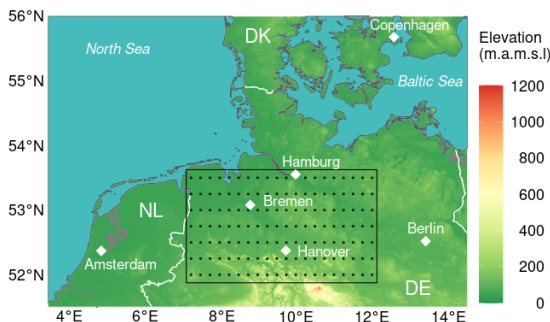
Research Question:

What are the meteorological differences
between lightning in different seasons?

Data & Methods

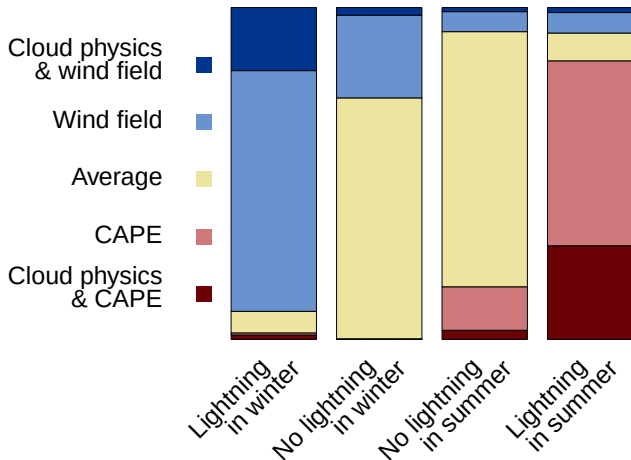


- Meteorological data: ERA5 (1h, 0.25° lon/lat)
- Lightning data: EUCLID
- Method: k-means cluster analysis



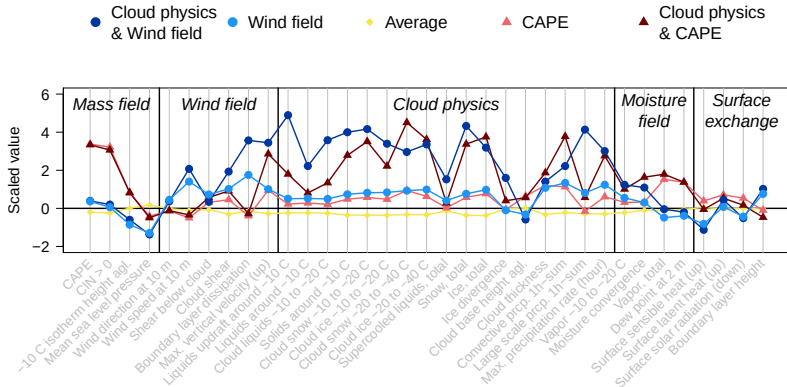
Morgenstern D., Stucke I., Simon T. et. al. (2022): Differentiating lightning in winter and summer with characteristics of the wind field and mass field. *Weather Clim. Dynam.*, 3, 361–375, <https://doi.org/10.5194/wcd-3-361-2022>

Thunderstorms differ by season



Morgenstern D., Stucke I., Simon T. et. al. (2022): Differentiating lightning in winter and summer with characteristics of the wind field and mass field. *Weather Clim. Dynam.*, 3, 361–375, <https://doi.org/10.5194/wcd-3-361-2022>

Meteorological characteristics

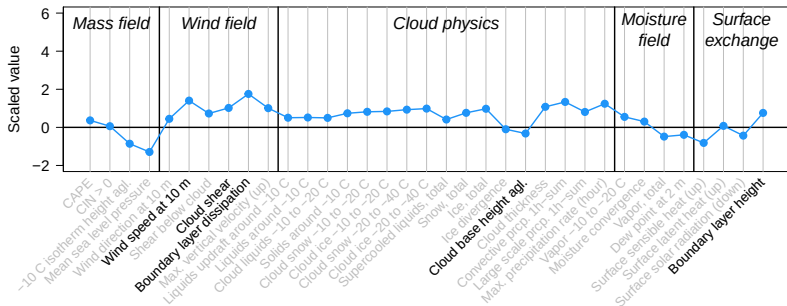


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Meteorological characteristics



Thunderstorm type: Wind field

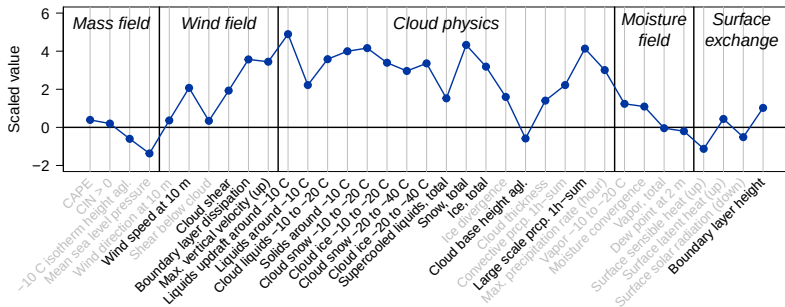


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Meteorological characteristics



Thunderstorm type: cloud physics & wind field

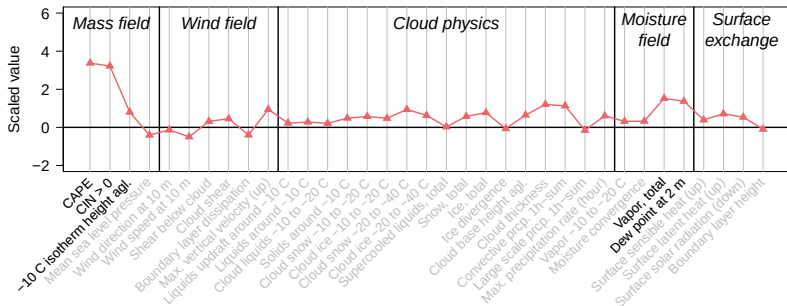


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Meteorological characteristics



Thunderstorm type: CAPE

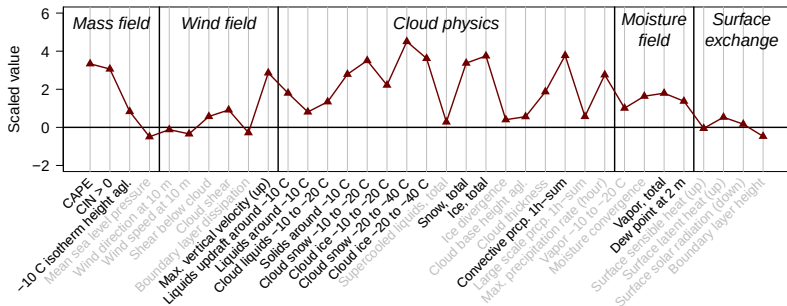


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Meteorological characteristics

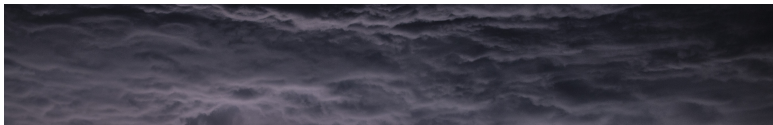


Thunderstorm type: cloud physics & CAPE



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Summary



Winter lightning is not just a weaker and rarer sibling of summer lightning but driven by wind-field variables instead of mass-field variables.



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