

Anmeldung eines Themas für eine Masterarbeit

Topic	Influence of Arctic Stratospheric Polar Vortex Dynamics on Midlatitude Tropospheric Weather Patterns in the Northern Hemisphere
Release Date	23 . 08 . 2024
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Description:	<p>The Arctic stratospheric polar vortex (SPV) is considered one of the most significant sources of sub-seasonal predictability for European weather during mid- and late winter. This is due to the fact that an unusually strong SPV is statistically followed by prolonged (up to 60 days) positive phases of the North Atlantic Oscillation (NAO), while an unusually weak SPV tends to precede prolonged negative phases of the NAO. This correlation is attributed to episodes of troposphere–stratosphere interactions (Büeler et al., 2020). Some research has also significantly advanced our understanding of the potential links between temperature and the strength or displacement of the SPV, few studies have examined the interannual relationships between SPV intensity, SPV displacement, and temperature anomalies across the Northern Hemisphere (NH) (Ran et al., 2024).</p> <p>In this research, we aim to analyze how the dynamics and positioning of the SPV influence storm patterns, temperature, and precipitation across the mid-latitudes. We utilize SPV morphological data from 1979 to 2023, covering 44 NH winters, and additionally incorporate extensive observational and reanalysis data for tropospheric parameters.</p>
Literature:	<p>Büeler, D., Beerli, R., Wernli, H., & Grams, C. M. (2020). Stratospheric influence on ECMWF sub-seasonal forecast skill for energy-industry-relevant surface weather in European countries. <i>Quarterly Journal of the Royal Meteorological Society</i>, 146(733), 3675-3694. https://doi.org/10.1002/qj.3866</p> <p>Ran, X., Hu, D., Zhang, Y., & Liu, M. C. (2024). Relationship between the Stratospheric Arctic Vortex and Surface Air Temperature in the Midlatitudes of the Northern Hemisphere. <i>Journal of Meteorological Research</i>, 38(1), 39-52. https://doi.org/10.1007/s13351-024-3072-7</p>