

ATS/CIRA Colloquium

Thomas Birner

from Ludwig Maximilian University of Munich

Hosted by Dave Thompson

3 p.m. Thursday, May 2

ATS 101 (In-Person Only)

Stratospheric Impact on Sub-Seasonal to Seasonal (s2s) Predictability in the Northern Extratropics

Extreme states of the polar stratospheric circulation during winter tend to be followed by anomalies in the near-surface circulation for several weeks, especially over the North Atlantic/Eurasia sector. Previous research has highlighted an associated robust increase in subseasonal to seasonal (S2S) forecast skill related to forecast ensemble mean anomalies. This talk will be centered around the additional impact of polar stratospheric circulation extremes on ensemble spread, a key measure of forecast uncertainty and the associated predictability. Over certain regions (e.g., the Norwegian Sea and around Scandinavia) S2S ensemble spread in near-surface geopotential height is found to be significantly reduced following weak polar vortex states (enhanced predictability), whereas it is increased following strong polar vortex states (reduced predictability), with anomaly magnitudes reaching as high as 20%. Decreased forecast uncertainty is found to be linked to decreased synoptic-scale storm activity and vice versa for increased forecast uncertainty. These relations can also be seen from a weather regime perspective. Furthermore, following sudden stratospheric warmings S2S forecast uncertainty is significantly reduced within the stratosphere and this projects significantly onto the final warming date in years with sudden warmings.

Colloquia page: atmos.colostate.edu/colloquia