

Upscale Influence of Mesoscale Convection on the Mid-latitude Jet Stream: Dynamics and Predictability of Negative Potential Vorticity

Alex Lojko NSF NCAR/MMM

An additional perspective is introduced for evaluating the upscale interactions between convective storms and the mid-latitude jet stream. Using theoretical frameworks and aesthetic model simulations, the presentation begins by showing that regions of Ertel's Potential Vorticity (PV) with negative sign can develop in the Northern Hemisphere. More notably, negative PV along the tropopause can serve as an Eulerian fingerprint for air that arises from deep convective clouds. These regions of negative PV can undergo 'upscale' growth in the presence of strong vertical wind shear, facilitating aggregation of negative PV onto the synoptic-scales. The presentation provides insight on the climatological characteristics of synoptic-scale negative PV and evidence of its influence on the evolution of the jet stream. Implications for predictability degradation are also highlighted by leveraging archived forecast data and experiments with the Model for Prediction Across Scales (MPAS). The presentation concludes with preliminary findings from year-long global storm-resolving MPAS simulations as part of the next phase of the DYAMOND initiative.

Thursday, 24 October 2024, 2:00PM <mark>Refreshments 1:45PM</mark> Please also join colleagues for refreshments and informal discussion after the seminar until 3:30pm

> NSF NCAR-Foothills Laboratory, 3450 Mitchell Lane FL2-1022, Large Seminar Seminar will also be live webcast https://operations.ucar.edu/live-mmm

Participants may ask questions during the seminar via Slido.

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