Atmospheric Mesoscale Kinetic Energy Spectrum in a Global Model

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Observational analysis indicate that atmospheric kinetic energy spectra scales approximately k^{-3} at synoptic scale and $k^{-5/3}$ at mesoscales, where k is the horizontal wavenumber. Results from an idealized test case to explore impacts of terrain on kinetic energy spectra will be presented. We modified Held & Suarez test case in a global high-resolution model and investigate the role of gravity waves induced by orography. Using analysis for divergent and rotational mode, interaction between topography and flow will be shown and sensitivity of model numerics and configurations for kinetic energy spectra will be introduced. Other issues associated numerical configurations for transition of slope and the tailing off will be also discussed in this presentation.