MMM SEMINAR SERIES

A preliminary look at critical-level absorption of convection-generated GWs observed during the CGWaveS field campaign

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The Convective Gravity Waves in the Stratosphere (CGWaveS) field campaign recently took place 20 May to 14 June 2025, utilizing the NSF/NCAR Gulfstream V research aircraft to observe GWs, in situ and remotely, generated by intense midwestern convection at night. The NSF/NCAR GV was instrumented with vertical and vertical-forward-looking lidars sensing temperatures from z ~ 25 - 65 km and sodium densities and winds in the sodium layer from z ~ 70 - 95 km. Additionally, three OH layer imagers were deployed to observe GWs present in the OH layer at z ~ 87 km, providing 2-D GW observations from an ~900 km cross-track swath. Ninety hours over 13 flights were flown, traveling ~44,500 miles while sampling primarily radially from organized convection over much of the contiguous US. Here, preliminary results from research flights with observations to the west of the convective systems are highlighted. Linear theory and parameterizations predict convection-generated, westward-propagating GWs in these regions should encounter critical levels and dissipate in the summertime stratospheric easterlies. The zenith-pointing Rayleigh lidar observed these waves in the relevant altitudes, with shorter vertical wavelengths west of the convection compared to east, consistent with theory and parameterizations. Four-dimensional context is provided via deep (top at z ~ 80 km) WRF simulations of the observed events, forced by diabatic heatings predicted from a neural network using weather radar observations at input.

Thursday, 6 November 2025, 2:00PM

Refreshments 1:45PM

Please also join colleagues for refreshments and informal discussion after the seminar until 3:30PM

NCAR-Foothills Laboratory, 3450 Mitchell Lane

FL2-1022, Large Seminar

Seminar will also be live webcast

https://sundog.ucar.edu/public/page/MMM

Participants may ask questions during the seminar via Slido.