2017 Workshop: Gravity waves in MTI

Long title
The propagation, dissipation, and influences of atmospheric gravity waves in the mesosphere, thermosphere and ionosphere
Conveners
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Description

In this workshop, we explore the propagation, dissipation, and influences of atmospheric gravity waves in the mesosphere, thermosphere and ionosphere. We include any source of gravity waves at any latitude/longitude. We emphasize studies which combine modeling results with observations in order to further our understanding of the coupling between these different regions. However, purely modeling and/or experimental studies are also welcome.

Atmospheric gravity waves provide an important mechanism for transporting energy and momentum from the lower atmosphere to the middle and upper atmosphere that can influence the global circulation and structure of the atmosphere. In addition, in-situ breaking and dissipation of primary waves can generate secondary waves that can continue to propagate to higher altitudes making identifying wave sources difficult. As such, understanding and tracking the propagation of waves from their sources, throughout the vertical layers of the atmosphere, to their dissipation is an important and challenging area of study. Observations are often limited to specific layers, locations, and resolution while modeling studies can simulate the propagation throughout the atmosphere but require suitable constraints of sources and spectra from observations. Overcoming this limitation requires the use of multi-site/mulit-layer observations and data alongside well constrained modeling studies that can fill in the gaps.

The objective of this session is to leverage modeling, theory and multi-site/multi-instrument observational studies of gravity waves that elucidate coupling between different layers of the atmosphere and to their sources mechanisms in order to

enhance our understanding of the gravity wave lifecycle and subsequent spectra and influences at different altitudes.

Agenda

Schedule of Talks Thursday

1:30-1:45 Andriy Zalizovskyy (pdf), "Daily and seasonal variations of TID parameters over Antarctic Peninsula"

1:45-2:00: Mike Taylor, "Seasonal propagation characteristics of MSTID's observed at high-latitudes over central Alaska using the Poker Flat ISR"

2:00-2:15: Jihye Park, "Detection of Traveling Ionospheric Disturbances from various sources using Global Navigation Satellite System"

2:15-2:30: Gerald Lehmacher, "A quasi-monochromatic wave event in the equatorial mesosphere observed with the Jicamarca radar."

2:30-2:45: Dave Fritts,"Instability dynamics and turbulence in the mesosphere comparing high-resolution modeling and polar mesospheric cloud imaging."

2:45-3:00 Lynn Harvey, "Advertising a new gravity wave dataset from the CIPS instrument on AIM: Comparisons with AIRS"

3:00-3:15 Jonathan Snively, "Airglow responses under high vs. low mesopause conditions"

3:15-3:30 Sharon Vadas, "Viscosity in the thermosphere: Evidence from gravity wave, neutral wind and direct lab measurements that the standard viscosity coefficients are too large in the thermosphere; and implication for gravity wave propagation in the thermosphere"

Schedule of Talks Monday

1:30-1:45: Dave Fritts, "Mountain wave breaking, instability dynamics, and momentum fluxes over New Zealand under weak forcing conditions"

1:45-2:00: Sharon Vadas, "A 2D transformation method to analyze gravity waves (GWs) near the pole in a GW-resolving global circulation model, and application to

GW processes over McMurdo, Antartica"

2:00-2:15: Katrina Bossert, "Gravity Wave Spectra and Downward Propagation over ALOMAR"

2:15-2:30: Brian Laughman, "Modeling Mountain Wave Breaking over the Andes: Early High-Resolution Compressible Results"

2:30-2:45: Richard Collins, "Wind Filtering and Unbalanced Flow Generation in Middle Atmosphere Gravity Wave Activity at Chatanika Alaska"

2:45-3:00: Christopher Heale, "Numerical Simulation of Convective Wave Generation over Florida"

3:00-3:15: Jonathan Snively, "Gravity Wave Coupling Across the Brunt-Vaisala Frequency"

3:15-3:30: Additional talk or discussion

Justification

Coupling between the lower and upper atmopshere/ionosphere via gravity waves.

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