2012 Workshop: Lidar Discoveries and Advances

Long title
New Discoveries and Advances by Lidar from Polar to Tropical Regions
Conveners
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Description

Starting in year 2010, several new lidar observational campaigns are being conducted worldwide, including two Fe lidar installations at McMurdo and Davis stations in Antarctica, a Na lidar campaign in Cerro Pachon, Chile, a new campaign at Logan, Utah with the relocated CSU Na lidar to USU, and observations at Boulder, Colorado with a newly constructed Na lidar. Plus continuing lidar observations at ALOMAR, Arecibo, Poker Flat with multiple instruments, and many other lidar observations being continued by CEDAR researchers, resonance and Rayleigh lidars are providing new and exciting data to the CEDAR science community. The renewed Consortium of Resonance and Rayleigh Lidars (CRRL) are enhancing the coordinated community effort for lidar innovation and science advancement. Collaborative studies among lidar groups and with co-located radar, imager, ionosonde, etc. and with satellite measurements have provided new potentials for multi-dimensional studies of the global upper atmosphere. This lidar workshop will provide a platform for the newest results to be presented, stimulating more science collaborations among observations, data analysis and modeling, and seeking new science potentials.

Intriguing results including significant science discoveries have been obtained in the physics, chemistry and dynamics of the middle and upper atmosphere. Good progress is being made in lidar development and innovation. We encourage presentations on various topics related to CEDAR lidar research, including but not limited to layered phenomena in the mesosphere and thermosphere, neutral and ion chemistry, characterization of gravity, tidal and planetary waves, wave dynamics, sources and impacts, coupling among different atmospheric regions, and lidar

technology advancement. Both observations and modeling are welcome to this workshop. Discussion on lidar technology is also welcome.

Agenda

1. Shikha Raizada, Studying ion-electron-neutral coupling using resonance lidars at Arecibo.
2. Wentao Huang (Xinzhao), Thermospheric Fe layer and the latest results from McMurdo.
3. Zhibin Yu, Solar effects in the diurnal variations of Fe layer at McMurdo
4. Richard Walterscheid, Small scale waves, turbulence and transport
5. Xian Lu (Alan Liu), Diurnal variation of gravity wave momentum flux and its forcing on the diurnal tide (derived from meteor radar)
6. Titus Yuan, SSW impacts on mid-latitude mesopause region
7. Yucheng Zhao, Mesospheric temperature measurements at ALO and USU/BLO using Na lidar and Mesospheric Temperature Mapper
8. Fabio Vargas, High-Frequency gravity waves observed by nightglow imagers in Chile and Brazil

Coffee Break

1. Mike Taylor, Multi-instrument measurements of mesospheric events at USU/Bear Lake Observatory
2. Chris Chen, Inertia-gravity waves in the MLT revealed by simultaneous lidar and radar observations at McMurdo
3. Fabio Vargas, Circular wave front observed at ALO
4. Biff Williams (Dave Fritts), Measuring horizontal structures in breaking waves with mobile or horizontally scanning lidars
5. Rich Collins, Lidar technologies for the large-aperture lidar/optical facility
6. Chet Gardner, Requirements for flux and transport measurements
7. Weichun Fong (John Smith), Achieving high efficiency for STAR lidar at CTC
8. Biff Williams (Gerd Baumgarten), Wind profiling from 30 to 105 km at ALOMAR

Justification

This session is relevant to the active lidar campaigns and studies being conducted by numerous groups in US and in the world. It provides a platform to present the coordinated measurements, science studies and technology innovations by the renewed CEDAR lidar consortium.

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