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New measurements of McMurdo gravity wave parameters

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Available at: https://works.bepress.com/jonathan_pugmire/17/
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ANGWIN Workshop, Oct 2, 2014
ANtarctic Gravity Wave Imaging Network (ANGWIN)
Journey to McMurdo
McMurdo Station (77°S, 166°E)
Arrival Heights

IR Camera
All-sky IR Imager

• Infrared (0.9-1.7 µm) cooled InGaAs camera.
• Records image every 10 s.
• 3 second exposure.
Data 2012

- Calibrated using star field
- Stars removed
- Flat Field
- Unwarped to 350 x 320 km
- FFT Analysis

- ~60 nights of data
- ~400 wave events
Wavelength

Average horizontal wavelength: 22 ± 10 km
Horizontal Phase Speed

Average phase speed: $42 \pm 23 \text{ m/s}$
Direction of Propagation

March-May

June-July

August-September
Direction of Propagation
Days 216-230

22 ± 12 km
Wavelength

56 ± 26 m/s
Phase Speed

Direction of Propagation
Summary/Future Work

- Optical observations of gravity wave activity over McMurdo are a new and ongoing study. Initial results are promising although further data reduction and analysis is needed.
  - Average wavelength is $22 \pm 10$ km.
  - Average phase speed is $42 \pm 23$ m/s.
  - Direction of Propagation has 3 dominant directions.
  - Several weeks of clear nights with lots of wave activity.

Finish analyzing results from McMurdo 2012 Session.
- 23 Nights have University of Colorado Fe Lidar observations.
- Analyze medium scale gravity waves using keograms.
- See my AGU poster.

Analyze McMurdo 2013 Session.