

**Non-Stop High-Resolution Imaging Studies of
Mesospheric Gravity Waves at South Pole
and
First Imaging Results from the DEEPWAVE Mission**

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This presentation highlights new research capabilities and recent results using a high-resolution infra-red imaging system operating at Amundsen-Scott Base, South Pole, Antarctica since 2011. The Advanced Mesospheric Temperature Mapper (AMTM) is a novel infrared digital imaging system that measures selected emission lines in the mesospheric OH (3,1) band (at ~1.5 microns) to create high-quality intensity and temperature maps of a broad spectrum of mesospheric gravity waves (with periods ranging from several minutes to many hours). The data are obtained with an unprecedented spatial (~0.5 km) and temporal (typically 30 sec) resolution over a large 120° field of view enabling detailed measurements of wave propagation and dissipation at the ~87 km level, even in the presence of strong aurora.

These results will be complemented by high-resolution (4 sec) gravity wave observations using a similar instrument developed for airborne measurements as part of the recent DEEPWAVE mission. This international program was designed to quantify gravity wave dynamics and effects from the ground to the mesosphere in unprecedented detail utilizing a range of airborne and ground-based sensors. The mission was based in New Zealand with multiple research flights during the Austral winter, June-July 2014, focused on investigating a well-known gravity wave “hot spot” region as identified in satellite stratospheric measurements over the Southern Ocean.