

# Observational and modelling study of mesospheric bores

**P.J. Loughmiller** (1), M.C. Kelley (1) and M.P. Hickey (2)

(1) School of Electrical and Computer Engineering, Cornell University, Ithaca, New York, USA, (2) Department of Physical Sciences, Embry-Riddle Aeronautical University, Daytona Beach, Florida, USA

In studies of the dynamics of the upper atmosphere, some of the most intriguing mesospheric phenomena observed high over the Hawaiian night skies are wall waves and internal bores. These events are documented in airglow images taken by high performance all-sky CCD imaging systems operating on top of Haleakala Crater, as part of the ongoing, collaborative Maui - Mesosphere and Lower Thermosphere (MALT) campaign, jointly sponsored by the National Science Foundation and the Air Force Office of Scientific Research. Bolstered by the Maui-MALT dataset, several theories now exist for mesospheric bores, agreeing in principle that they are likely nonlinear structures spawned by gravity waves and propagating within a thermal inversion layer. A new investigation will model optical emissions using a robust, time-dependent chemical dynamics model to explore the airglow response to ducted gravity waves and, in turn, the geographical and vertical coupling relationships which may exist.