



A multiple instrument study to differentiate primary versus secondary gravity-wave generation in the mesosphere

Patrick Espy (1,2), Teferi Demissie (1,2), Morten Hatlen (1), Robert Hibbins (1,2), Rosmarie de Witt (1), Gary Swenson (3), and Fabio Vargas (3)

(1) Norwegian University of Science and Technology, Department of Physics, Trondheim, Norway (patrick.espy@ntnu.no, +47 7 3597710), (2) Birkeland Centre for Space Science, Box 7803, N-5020 Bergen, Norway, (3) University of Illinois, USA

A sensitive, all-sky camera has been used to image mesospheric airglow emissions at Trondheim, Norway (63.4N, 10.3W) during the winter of 2012-2013. Images of the hydroxyl and sodium airglows have been used to infer the presence of gravity waves passing through these layers located between 87 and 93km. Simultaneously, a new, 30kW, momentum-flux meteor-radar system observed the horizontal wind field. These data, along with meteorological balloon soundings, have been combined with a code to trace gravity-waves from their source regions in order to differentiate primary from secondary wave generation mechanisms. We will present the image analysis and the effects of the background wind field on the gravity-wave transmission in order to ascertain the source region of the waves observed near the mesopause.