

Study on Gravity Waves Combining Ground Based and Satellite Measurements

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Four medium-scale gravity waves were studied using images of the NIR OH airglow emission obtained from an all sky imager deployed at São João do Cariri (36.5°W; 7.4°S) and mesospheric temperature profiles from the TIMED/SABER satellite. The coincident measurements were made on 11 and 14 April 2007, 08 February and 28 August 2008. The horizontal parameters of the gravity waves were estimated using the keogram analysis and the vertical ones were calculated from the coincident temperature profiles collected into the area of 15° x 15° degrees (longitude X latitude), centered at the observatory. The horizontal wavelength were 190, 138, 171 and 355 km, respectively. The observed periods were 50, 20, 33 and 20 min. The vertical wavelength were 15, 10, 15 and 30 km. Comparisons to the dispersion relation for the gravity waves were done and the results are in agreement to the theory. Thus, the SABER satellite measurements may be used to study the gravity wave activity in the mesosphere and lower thermosphere with good precision.