Observed wave-wave interaction seen through OH airglow emission at mesosphere region

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The study of the mesosphere dynamics is a very active research area at present. Since gravity waves play a significant role in this region by transporting energy and momentum from lower to the upper atmosphere, then a special effort has been made to study gravity waves generation and propagation in the Brazilian sector. Besides that, wave-wave interaction at mesosphere heights is not well explored topic. Observation of OH nightglow emission carried out at Palmas (10.2° S, 48.2° W, near equatorial region), Brazil on May 29, 2008 showed a very uncommon event of gravity wave, that was identified as an interaction between two mesospheric fronts. Around midnight there appears two gravity waves in the field of view of an all-sky OH imaging system, in the east and west sectors. The two wave fronts extend in the north-south extension and propagate in east-west direction. In fact the gravity waves move in almost opposite way and when they cross each other, a region between the wave fronts shows a band of airglow depletion. This is a typical example of a non linear wave-wave interaction. Also, meridional and zonal wind components were taken from a meteor radar that operates at São Joao do Cariri (7.4° S, 36.5°W), Brazil. The measurements consisted of three consecutive nights (May 27-30, 2008) and were used to verify possible changes in the wind pattern during this event, and also to infer the intrinsic wave parameters. Temperature observations from Timed/Saber satellite will be used together with the wind measurements to characterize the vertical propagations for the observed waves, and then check if any type of duct is supporting these waves.