

# **First observations of thermospheric bores using all-sky oi 630 nm emission images: two cases studied in the brazilian tropical sector**

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Using data from ground-based and satellite measurements we investigate the unusual thermospheric disturbance events that occurred in the equatorial and low latitude regions in the Brazilian sector. On the nights of September 07-08, 1997 and July 13-14, 1999, the all-sky imaging observations of the OI 630 nm emission carried out at Cachoeira Paulista (22.7°S, 45°W, magnetic declination 20°W), Brazil, showed dark band structures, stretched across the entire imager, propagating from southeast to northwest. These dark patches moved with a velocity of about 230 m/s at an altitude of 250-300 km, which is the typical altitude range of the OI 630.0 nm airglow emission. Also, ionosonde observations, available for one of the events, registered abrupt increases in both the F-layer peak height (hpF2) and base height (h'F), when the low intensity band passed over Cachoeira Paulista. This behavior seems to be related with equatorward wind velocity enhancements, which pushes the F-layer plasma to higher altitudes along the geomagnetic field lines, thus causing the 630 nm airglow intensity reduction. It should be pointed out that these thermospheric events are not related to geomagnetic disturbed conditions. Also, on one of the nights, near simultaneous measurements of NIR OH, OI (557.7 nm) and O<sub>2</sub>(0,1) emissions showed active wave structures in the mesospheric region and around midnight, the all-sky imaging observations of mesospheric emissions showed a bore-like wave-front passing overhead and propagating equatorward. In addition, the weather maps obtained by the GOES satellite identified possible sources of internal gravity waves (cold front and jet streams) in the tropospheric region, during these two nights. In this work we present and discuss the influence of internal gravity waves, generated in the troposphere (propagating upward through the mesosphere and reaching the bottomside of the nighttime F region), as the main cause of these thermospheric disturbances.