



MEDIUM-SCALE GRAVITY WAVES OBTAINED FROM AIRGLOW ALL-SKY OBSERVATION OVER CACHOEIRA PAULISTA

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ABSTRACT

Images obtained from OH and OI 557.7 nm airglow emissions were used to investigate the characteristics of medium-scale gravity waves observed in the mesosphere and low thermosphere region, between 1998 and 2013 over the Cachoeira Paulista Observatory, SP, Brazil (22.4°S; 45.0 °O). Using the keogram technique, the results showed that 142 gravity wave events observed in the airglow emission have the following characteristics: horizontal wavelength between 50 and 500 km, observed period between 20 and 80 min, phase velocity between 40 and 100 m/s. The propagation directions of medium-scale gravity waves showed a season variation: in the summer the waves propagate to Northeast and Southeast directions, during autumn the waves propagate mainly to Northwest direction, in winter almost an isotropic propagation were observed, while during spring the waves propagate to Northeast and Southeast. A comparison of propagation directions between small and medium-scale gravity waves was also performed, showing that the main propagation directions of small and medium-scale gravity waves are similar for each season of the year. The results led us to conclude that both small and medium scale gravity waves may be related to the same wave source at the lower atmosphere. The meteorological phenomena that were related to generate small-scale gravity waves over Cachoeira Paulista are the cold frontal and convective systems.