



## **A study of the gravity wave horizontal wavenumber spectra and the spectral slope variation inferred from airglow image data at Cachoeira Paulista (22.7°S) and São João do Cariri (7.4°S), Brazil**

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This work presents a study of the horizontal wavenumber spectra  $F(h)$  ( $h$  represents the horizontal wavenumber) of gravity waves observed by imagers at Cachoeira Paulista (22.7°S, 45°W) in 1999 and São João do Cariri (7.4°S, 36.5°W) in 2001. Images of OH, O<sub>2</sub>(0-1) and OI5577 airglow emissions were analyzed. The mean spectral slope of  $F(h)$  calculated for Cachoeira Paulista were 2.11±/0.35, 1.39±/0.39 and 1.29±/0.32 for OH, O<sub>2</sub> and OI5577 emissions, respectively. Results of Cariri showed 2.04±/0.28, 1.55±/0.40 and 1.49±/0.34 spectral slope values for the same emissions. The OH spectral slope was larger than the other emissions slopes at both observations sites, suggesting us a wave filtering mechanism among emission layers. The slope value differences can be also consequence of photochemical effect, because the airglow layers responses are different due to a gravity wave passage through the emission layers. The correlation coefficient between OH and O<sub>2</sub> spectral slope for Cachoeira Paulista was 0.90, and the correlation at Cariri was 0.29, leading us to conclude that the wave filtering mechanism among OH and O<sub>2</sub>–OI5577 layers was strongest at Cariri.