

The lunar tides in the ionosphere over Brazil

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The atmospheric lunar tide is excited by gravitational action in the lower atmosphere and by the movement of the oceans and Earth's surface. Due to the fact that the source of the lunar tide does not change, the determination of this oscillation in the ionosphere is an excellent tool for understanding the coupling mechanism between the neutral and ionized atmospheres. The lunar tide has been studied in the mesosphere-thermosphere-ionosphere in different longitudinal sectors and using different observational techniques and simulations. However, there are some aspects of lunar tide that still need explanation, for example, the temporal variability of this oscillation. So, in this work, the diurnal and semidiurnal lunar tides are investigated in the ionosphere using ionosonde data over Brazil. The ionosonde measurements were collected at Cachoeira Paulista (22.7° S; 45.0° W) and São Luis (2.6° S; 44° W) from 2001 to 2009 with a temporal resolution of 15 minutes. Using these data, it was possible to extract the characteristics of the lunar tide. Salient features of this oscillation are presented and discussed in this work. For instance, the semidiurnal lunar tide is dominant comparing to the diurnal tide and had amplitude of 0.6 MHz in foF2 and 7 km in hmF2.

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