EFFECTS OF LUNAR TIDES IN THE F REGION OF THE IONOSPHERE

Tsali-Brown, V. Y.* [1]; Paulino, A. R. [1]; Lima, L. M. [1]; Batista, I. S. [2]; Batista, P. P. [2]

[1] Paraíba State University (UEPB),
R. Baraúnas, 351, Bairro Universitário, Campina Grande, PB – ZIP Code: 58429-500, Brazil;
[2] National Institute for Space Research (INPE),
Av. dos Astronautas, 1.758, Jardim da Granja, São José dos Campos, SP – ZIP Code: 12227-010, Brazil.

ABSTRACT

The effect of the lunar tide in the F region of the Brasilian ionosphere was studied in this work using measurements provided by the ionosonde installed in Cachoeira Paulista (22.7 ° S, 45.0 ° W) from 2009 to 2011. To identify the variations associated with the lunar tides, the following parameters were used: height of maximum density of the F2 region (hmF2) and the critical frequency of the F2 (foF2) region. The influence of the lunar tide in the ionosphere was then obtained using the residual measurements which were calculated by removing the influence of the solar tides for each day. The solar time of the measurements were also converted to lunar time. In order to obtain the monthly amplitudes and phases of the lunar tide components, harmonic analysis was performed. The maximum amplitude value obtained in foF2 was ~ 0.41MHz for the diurnal component and ~0.42MHz for the semidiurnal component. Also the maximum amplitude value obtained in hmF2 was ~6.25 km for the diurnal component and ~7.76 km for the semidiurnal component. The seasonal variations for the amplitudes in foF2 and hmF2 exhibited annual and semiannual patterns.

* Vera Yesutor Tsali-Brown (yesutor4@yahoo.com)