

Electric Field Effects in Sporadic E-Layers at Equatorial Regions During Disturbed Periods

Resende, L. C. A. [1]; Batista, I. S. [1]; Denardini, C. M. [1]; Carrasco, A. J. [2]; Andrioli, V. F. [1,4]; Moro, J. [3]; Batista, P. P. [1]; Chen, S. S. [1]

[1] National Institute for Space Research (INPE), Av. Dos Astronautas, 1758, S. J. Campos-SP, Brazil - CEP: 12.221-970;

[2] Physics Department, Universidad de Los Andes Merida, Venezuela

[3] Southern Regional Space Research Center (INPE), Caixa Postal 5021, Campus Universitário, Santa Maria, RS - CEP: 97105-970.

[4] China-Brazil Joint Laboratory for Space Weather – NSSC-INPE, Av. Dos Astronautas, 1758, S. J. Campos-SP, Brazil - CEP: 12.221-970

In the present work we analyze the influence of the electric fields in the sporadic E-layers at equatorial regions, Jicamarca (11.57°S, 76.52°O, I: -2°) and São Luís (2°S, 44° O, I: -2.3°) during magnetically disturbed periods. In fact, we analyse the disturbed electric fields role in the occurrence or disruption of Es layers through simulations and observational data. We use a theoretical model for the E region, called MIRE, that computes the densities of the metallic ions (Fe⁺, Mg⁺) and of the main molecular ions (NO⁺, O₂⁺, N₂⁺) by solving the continuity and momentum equations for each one of them. Electron density calculated by these simulations were compared with the Es layer, deduced from the blanketing frequency parameter (*f*bEs) obtained from ionograms in each analyzed region. The analysis shows that the enhancements or disruptions that occur in the Es layer are well correlated with the disturbed electric field directions. Therefore, this work presents novel and interesting results that help to improve the understanding of Es layer behavior during disturbed periods.