

THE SUPPRESSION OF SPREAD F OVER SAO LUIS DURING OCTOBER 2003 STORM: A NUMERICAL SIMULATION

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In this work, we present a numerical simulation of collisional interchange instability (CII) in the equatorial-low latitude ionosphere. The simulation code adopts electromagnetic framework solving hydro-magnetic equations. The governing equations are solved in magnetic dipole coordinate system. We have chosen October 2003 storm event when ionosphere over Sao Luis was found to move upward rapidly. We have found that bubble does not develop in spite the large vertical drift. On the other hand, with identical ionospheric condition except vertical drift, bubble could develop for usual pre-reversal drift values. It is suggested that under abnormally large upward drift, ionosphere moves to higher altitude prior to the linear CII growth. In the higher altitude region, bubble growth is substantially reduced owing to the finite inertia. The results obtained in this study are compared with the recently reported observations during October 2003 storm.

Plasma instability, geomagnetic storm