

THE THREE DIMENSIONAL SIMULATION OF COLLISIONAL INTERCHANGE INSTABILITY IN THE EQUATORIAL-LOW-LATITUDE IONOSPHERE

E. Alam Kherani - Instituto Nacional de Pesquisas Espaciais,

M.H.A. Muela - Instituto Nacional de Pesquisas Espaciais,

E. R. de Paula - Instituto Nacional de Pesquisas Espaciais,

E-mail for contact: alam@dae.inpe.br

Abstract

In the work, we present a 3D simulation model 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 discuss the following aspects in the work: (1) current distribution associated with plasma depletions or bubbles, (2) Mapping of bubble from equator to low-latitude, (3) Effects of pressuregradient force on the evolution of bubble. Some of these aspects are discussed in the perspective of GPS observations over Brazil.