Geophysical Research Abstracts, Vol. 8, 04120, 2006
SRef-ID: 1607-7962/gra/EGU06-A-04120

Modelling of proton nose structures with self-consistent electric fields in the inner magnetosphere

N. Buzulukova (1), V. Vovchenko (1)
Space Research Institute, Moscow, Russia

We present the results of calculation of nose structures formation in the inner magnetosphere, using numerical model of self-consistent electric field and stationary magnetic field. The considered model is similar to RCM, and computes zone II field-aligned currents and corresponding ionosphere-magnetosphere electric field. Model input parameters - cross polar cap potential, ion and electron plasma sheet temperatures and concentration at the outer boundary of model region. Model output parameters - field-aligned currents, electric potential, particles concentration and fluxes in the inner magnetosphere. From output parameters we reconstruct proton energy-time spectrograms, among them proton nose structures. It is known that substorm nose structures are characterized by short time formation - less then half of hour. To explain that quick formation time, the pulse electric field in the inner magnetosphere is supposed. Using different sets of input parameters we investigate the role of cross polar cup potential, temperatures and concentrations on nose structure formation. The formation both of stationary nose structures (with constant input parameters) and substorm nose structures (with varying input) is considered. We attempt to answer the question: Can substorm nose structures be formed by self-consistent electric field or the pulse electric field is needed?

This work is partially supported by grants INTAS 03-50-4872, HIII-1739.2003.2 and MK-4085.2005.5