Longitudinal dependence of the plasma density in the plasmasphere according satellite measurements

D.V. Chugunin 1, G.A. Kotova 1, M.V. Klimenko 2 and V.V. Klimenko 2

1 Space Research Institute, Russian Academy of Sciences, Moscow, Russia

2 Institute of Terrestrial Magnetism, Ionosphere and Radiowave Propagation, West Department, Russian Academy of Sciences, Kaliningrad, Russia

The work is devoted to the study of the dependence of the plasmaspheric magnetic flux tubes filling on geographic longitude. Despite the fact that the magnetosphere is mainly described by magnetic coordinates, the filling of it with ionospheric plasma is also affected by the difference in the illumination of the base of the magnetic field lines. This issue is studied in this work using measurements of ion concentration on the INTERBALL satellite and electron concentration on the ERG satellite. For the study, only long quiet periods were selected, during which the magnetic flux tubes had time to fill with plasma to diffusion equilibrium. It was shown that for the same geomagnetic coordinates, the plasma density in the plasmasphere depends on geographic longitude. This dependence is also studied for different seasons.