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Two types of asymmetries of field –aligned currents distribution in polar ionosphere and of magnetosphere –ionosphere feedbacks during the substorm expansion phase

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Abstract

We use original magnetogram inversion technique created by Vilen Mishin, A. Bazarzhapov and G. Shpynev in Irkutsk more than 40 years ago. This method uses data of world net of ground-based magnetometers. It was also then developed in parallel in Russia in IZMIRAN (Feldshtein, Levitin, Belov, Papitashvili) and abroad by Kamide et all. Recently, this method is already very few people engaged in, all use the expensive data of multi-satellite projects such as AMPERE. However, our inexpensive method allows, with a 1 min resolution, to build maps of the distribution of field-aligned currents (FACs) and fields and to reveal fine structures in their zones–mesoscale cells, which is inaccessible for other methods. The report deals with two types of FAC distribution in the mesoscale cells of night auroral ionosphere. Also, two types of feedback in the magnetosphere-ionosphere system are investigated: of the intensity of field-aligned currents (FACs) with the ionosphere conductivity (type 1), and with the electric field (type 2). Explosive development of FACs during the substorm expansion phase in the nighttime mesoscale cells of the three Iijima and Potemra (I-P) regions connected by meridional currents, is described.

歡迎大家踴躍參加!