THE PLASMASPHERE AS A SOURCE OF THE MAINTENANCE OF THE NIGHT-TIME IONOSPHERIC F2-LAYER: MATHEMATICAL MODELING

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The processes of filling and depletion of the plasmasphere have been modeled by using the global numerical Upper Atmosphere Model (UAM). The global distributions of the electron density and the geomagnetic field-aligned plasma fluxes have been calculated with and without taking the field-aligned ion transport and the electromagnetic drift of the plasma.
It has been shown that in case when the initial plasmasphere is fully depleted, the H^+ fluxes at the 1000 km directed from the plasmasphere to the night-time ionosphere are maximal at the subauroral latitudes (~55°–60°) and they form the electron density maxima in the ionospheric F2-layer at these latitudes due to the peculiarities of the geomagnetic field geometry. The further plasmasphere filling process results in displacement of the subauroral enhanced electron density regions to the middle latitudes.

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