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Numerical Modeling of Dependence of Equatorial Electrojet, Generated by Dynamo-field, from Solar Activity Level for all Seasons

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In the given work the numerical calculation results on the Global Self-consistent Model of Thermosphere, Ionosphere and Protonosphere (GSM TIP) a dynamo-field generated by thermospheric winds, and appropriate this field equatorial electrojet are submitted. Research of dependence from solar activity level of equatorial electrojet, received by completely self-consistent manner for various seasons in quiet geomagnetic conditions is carried out. It is shown, that the greatest potential difference of dynamo electric field turns out for equinoctial conditions at any level of solar activity. Thus in maximum of solar activity it is higher, than in minimum. The greatest dependence from the level of solar activity is shown in a spring equinox when the maximal intensity of equatorial electrojet grows more, than factor 2 at transition from minimum of solar activity to maximum. The general tendency of growth of equatorial electrojet intensity with growth of activity is marked for all seasons. The narrowest equatorial electrojet turns out in the winter, and the widest in the summer for any level of solar activity. In all seasons equatorial electrojet is formed near to local noon that corresponds to observations. In evening sector it is replaced by the counter electrojet. Intensity of counter equatorial electrojet grows by the factor 2 for all seasons with growth of solar activity level from a minimum to a maximum. In summer solstice in maximum of solar activity the maximal value of the counter electrojet is displaced in winter hemisphere that is not present in minimum of solar activity. Distribution of zonal current in the middle and low geomagnetic latitudes are qualitatively similar for two equinoctial seasons, and for winter and summer seasons the pictures of distribution are inverted relative to geomagnetic equator.