

PLANETARY DYNAMICS OF IONOSPHERE STORMS

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Ionosphere storms have been studied for more than 40 years using ionozondes and incoherent scattering radars. Meanwhile, some morphological features and underlying physics still remain unclear. EISCAT measurements have shown that TEC is collinear to the NmF2 values. To study not only temporal but also spatial properties of the ionosphere storms we use global TEC data in the same manner as the ionozonde measurements. Namely, for any point we calculate 28 day running median for each hour - \widehat{TEC} . Then the deviation is determined as $\delta TEC = (TEC_{ij} - \widehat{TEC}) / \widehat{TEC}$. When δTEC exceeds 40% over the median value it is considered as the positive disturbance, and when it is less than 60% of the median value it is prescribed to negative disturbance. Years 1995-2004 have been processed. The results of morphological analysis explain the uncertainties in the data of the European ionozonde network. Under westward movement the zone of the positive disturbance may change its shape into the narrow structure and pass between ionozondes.

Very interesting fact is that during strong magnetic storms the coverage of the positive storms significantly increases the same for the negative storms in the mid-latitude region. Negative storms in the mid-latitude region only accompany the positive storms. In the auroral region clear but narrow negative storm is generated under magnetic disturbance.

Generally negative disturbances come to the midlatitudes from the North, traveling westward. Meanwhile, another class of disturbances exists, when the negative zone appears at the subequatorial latitudes (20N) and then moves to the midlatitudes. The rate of movement for the latter is 2-3 times larger than for the classical disturbances produced in the auroral zone.

Results of statistical spatio-temporal analysis are reviewed.

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