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Recurrent ionospheric storms during solar minimum
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Ionospheric storms related to geomagnetic disturbances are a subject of great scientific interest. We present a comprehensive analysis of perturbations in the low- and mid-latitude ionosphere during moderate recurrent geomagnetic storms (RGSs) in the solar minimum of 2007 - 2008. It is shown that during so-called recurrent ionospheric storms (RIS), the heliospheric - magnetospheric - ionospheric - thermospheric coupling remains highly efficient even during solar minimum. Analysis of global ionospheric maps of vertical total electron content (VTEC) derived on the base of GPS network showed that VTEC has a tendency to decrease and negative ionospheric storms occur right before the onset and on the late recovery phase of RGS. A positive ionospheric storm is developed on 2 to 4 day after the onset, i.e. on the recovery phase of RGS produced by high-intensity long-duration continuous auroral activity. The ionospheric response reveals prominent longitudinal and local time variations. Such effects as penetrating electric fields of interplanetary and magnetospheric origin, disturbance dynamo electric fields, neutral winds and thermospheric chemical composition changes are considered as possible mechanisms responsible for the observed recurrent ionospheric storms.

キーワード: ionospheric storms, recurrent geomagnetic storms, corotating interaction regions, high-speed solar wind
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