

Mechanisms of the March 07-11, 2012 and July 14-17, 2012 ionospheric storms

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We studied variations of ionosphere F2 layer parameters observed at nine vertical sounding stations located in the north-eastern Russia and compare them with those of the total electron content (TEC) over the stations. Analyzing the heliosphere and magnetosphere processes as well as the results of ionosphere-thermosphere simulations, we found associations between: (i) changes in B_y and B_z components of the interplanetary magnetic field and rapid global decreases of daytime F2 layer critical frequency, accompanied decreases of its peak height; (ii) increase in the flux of solar cosmic rays at geosynchronous orbit and disappearance of reflections from sub-auroral ionosphere. These results indicate that an overshielding electric field and precipitations of solar cosmic rays have to be taken into account in ionosphere storm models.

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