



## **Ionospheric effects and wave activity during CIR/HSSS-related storms above middle latitudes**

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The paper presents results of the analysis of the changes in the regular ionospheric variability and GW activity observed during CIR/HSSS-related storms (12 events in total) which occurred within the period of 2014-2017. We analyzed main ionospheric parameters retrieved from manually scaled ionograms and drift measurements recorded at several European and African middle latitude ionospheric stations and spectrograms obtained from Continuous Doppler Sounding System (CDSS). The results were compared with those obtained for strong magnetic storms of CME origin. Most of the observed extraordinary storm-related GWs were within the periods of 15-25 min. During the analyzed periods we also observed extraordinary spreads and plasma bubbles at the F region heights. We are going to analyze more CIR/HSSS-related events to test, if our results are statistically significant.