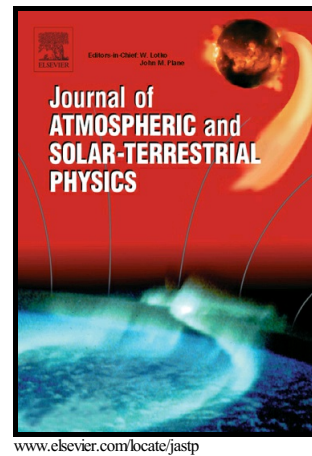


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Ionosphere dynamics in the auroral zone during the magnetic storm of March 17-18,
2015

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Abstract.

A comprehensive study of the ionospheric processes encountered during the superstorm which started on March 17th 2015 has been carried out using magnetometer, ionosonde, riometer, ionospheric tomography and an all-sky camera installed in the observatory of Sodankylä, Finland. The storm manifested a number of interesting features. From 12:00 on March 17 there was a significant decrease of critical frequencies foF2 and intensive sporadic Es layers were observed. During the disturbance, there was a lack of variation of the X- component of the magnetic field at times, but the absorption level measured by the riometer was high. A comparison of the electron density distributions for the quiet and disturbed days as shown in the tomography data were very different. Where results were available at the same times, the tomographic foF2 values coincided with the “real” foF2 values from the ionosonde. Where the ionosonde data was missing due to absorption, the tomographic foF2 values were used instead. The keograms from the all-sky camera showed that during disturbed days the aurorae manifested themselves as bright discrete forms. It was shown that the peaks of absorption due to particle precipitation seen by the riometer coincided in time with the brightenings of aurorae seen on the keograms.

Keywords: ionosphere, magnetic storm, foF2, absorption, aurora, magnetic field.

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