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Ionospheric irregularities and positioning by GPS

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The GPS system enables the determination of coordinates, - north, east and vertical components of the point in question. The accuracy of the positioning depends on the state of the medium through which radio waves are propagating. Serious errors may be caused by sudden increases of the solar activity (solar flares) followed by ionospheric storms or ionospheric irregularities. Ionospheric storms result in decrease, or increase of the electron density of the F-region, which create increase, or decrease of the vertical component affected mostly by the ionosphere. It has been studied the correlation of variations at different stations for establishment of the common origin of the variations. The ionospheric origin can only be shown in this case. On the basis of results of these investigaions, the anomalous cases have been compared with electron density in the F region. It has been found that anomalous variations of the vertical component are related to ionospheric variations, changes of the electron density distribution.