**IONOSPHERIC RESPONSE AND GPS POSITIONING ERRORS DURING THE MAIN PHASE OF THE 10-11 MAY 2024 GEOMAGNETIC STORM**

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Geomagnetic storms are space weather phenomena that are caused by the enhanced solar wind and its interaction with the magnetosphere. Geomagnetic storms significantly affect ionosphere and Global Navigation Satellite Systems (GNSS) positioning accurancy. We analyzed the ionospheric response to the main phase of the extreme geomagnetic storm of the 10-11 May 2024 using GNSS data. Our research focuses on the auroral oval boundary and displacements of the equatorial anomaly crests, as well as GPS precise point positioning (PPP). ROTI and global ionospheric maps showed the ionospheric dynamics. During the main phase the auroral oval extended up to 30°N in the western hemisphere and up to 45°N in the eastern hemisphere. ROTI values peaked at 2 TECU/min at 40°N geomagnetic latitude. At the same time, the crest of equatorial anomaly intensified up to 200 TECU and shifted polarward in the American sector. These processes have led to a unique phenomenon – the intersection of the auroral oval boundary and the equatorial anomaly in North America. In addition, the ROTI correlated with errors in the kinematic PPP. Positioning errors increased 1.5-5 times at the boundary of the auroral oval. The 10-11 May 2024 geomagnetic storm significantly affected the ionosphere and the positioning and, threatening several applications based on navigation and communications, requiring further studies.

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