



Study on the dependence of polar patch enhancement on dayside VTEC.

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The polar and auroral areas are recognized as the most disturbed parts of ionosphere. The reason for that is the shape of geomagnetic field allowing the transfer of solar energy into the ionosphere-magnetosphere system as well as plasma convection pattern at high latitudes. One of the consequences of such phenomena is an occurrence of polar patches. These structures are identified as positive enhancement of F-region plasma with size of several hundreds of kilometers surrounded by low-density background. As it is well-known, the patches propagate across the polar cap and their main source is the mid-latitude reservoir. Thus, in this contribution we presented GNSS-based analysis of patch enhancement dependence on dayside plasma. In order to derive the former parameter the signatures of patches were extracted from the time series of geometry-free linear combination (L4). We used using iterative algorithm of 4-degree weighted polynomial fitting for the definition of a background level of STEC variations. Thus, relative STEC enhancement for particular polar structure is the difference between raw L4 data and the final polynomial. In order to ensure the comprehensive view of patch occurrence, this indicator was derived from over 150 permanent stations (IGS, EPN, UNAVCO) located at the northern hemisphere. Regarding the dayside plasma, we used VTEC map provided by International GNSS Service. The results confirmed the dependence of patch enhancement on dayside VTEC. Furthermore, they results revealed the lack of these polar structures for strongly depleted ionosphere.