**High-latitude ionospheric irregularities associated with SED-Plume and TOI structures during the 7 November 2022 storm**

I.I. Shagimuratov1, I.I. Efishov1, G.A.Yakimova1, M.V. Filatov2,

N.Yu. Tepenitsyna1.

*1West Department IZMIRAN, Kaliningrad, Russia*

*2Polar Geophysical Institute of the Russian Academy of Science, Apatity, Russia*

We present the occurrence TEC fluctuations in relation to a storm-enhanced density (SED) and polar tongue of ionization (TOI) during moderate geomagnetic storm. On Madrigal TEC data base the structure SED-Plume was clearly registered over North America on the 7 November 2022 from 18UT to 21UT. The plume occurred around 45N○ and further extends to in the northwestward direction toward until 70○N (~70○ MLAT). In the plume TEC was twice the background. The TEC fluctuations (DTEC) in plume are registered from 70○N and exceeded the background on 2-3 times. The evolution of a SED plume into a TOI occurred at 15-17UT (10-12LT) in a narrow region from 65°N to latitudes greater than 80°N inside the polar cap. The spatial evolution of TEC and DTEC was very similar. In latitudinal profile of DTEC we detect maximum around 65○N (~70○ MLAT) associated with the auroral oval and one 80○N (~84○ MLAT) associated with TOI structure. It will be noted that the intensity of TEC fluctuations in TOI was higher than on auroral latitudes.