Reviewer comments to the paper by Urbar and Lastovicka

The paper considers long-term trends in the total electron content TEC and their spatial distribution. A brief description of the TEC data sources and previous attempts to derive trends in TEC is presented in the Introduction.

Section 2 describes the TEC data used for the analysis. Even though the long-term trends in TEC are a final goal of the study, the authors use homogeneous series JPL-35 of global TEC data for 1994-2014 to find the best solar proxy for revealing TEC trends. The UPC TEC maps for 2003-2023 are used to reveal trends in TEC. Yearly averages based on monthly medians are analyzed for the near-noon hours (10-14 LT). Special steps are undertaken to have the data for various longitudinal belts compared in the same local time.

Usual method of ionospheric trend derivation is applied and very briefly described in Section 2.

The authors formulate four criteria for selecting the best solar proxy to derive trends in TEC and apply them to six solar proxies. The results are presented in Table 1. Although all four criteria are fulfilled for all six proxies considered, the authors select the F30 proxy as the best for further searches of the trends. Their choices coincides with results of similar studies on trends in the F2-layer parameters.

The results of revealing the TEC trends are presented in Section 4 in Figs. 1-3 in the form of latitudinal profiles of the trends for 12 longitudinal belts. In all tree figures with these results, an interesting pattern is seen: a strong increase in the magnitude of the negative trends is seen near the equator and at very high latitudes of the Northern Hemisphere.

The authors consider in detail features of each group of profiles. In particular, they describe a statistical significance of all profiles in Figs. 1-3. An important detail is that the derived trends have overall a low statistical significance except for strong enough trends in the 20N-20S belt and at high latitudes.

Figure 4 is aimed to show time variations of the trends for 2000-2024. It demonstrates that the ΔTEC values oscillate near zero at 40 N and provide some changes at 12.5 N.

Comparing their mean trend of -0.108 TECU/year with the results of model evaluations, the authors note that it is slightly higher than the model one.

An interesting feature of the derived TEC trends is that they reveal a longitudinal structure at equatorial latitudes with strong negative trends at 0-60E and 180-240E and weak trends at 90-150E and 270-330 E.

I consider the paper under review as a substantial input into our understanding of the very important problem of long-term trends in the F2-region parameters. I recommend publishing the paper with a minor revision.

My only critical comment is as follows.

I am slightly confused by Fig. 4. It is written in the text: "Fig. 4 shows temporal evolution of TEC trends in terms of TEC residuals ΔTEC…". I have found no indication in the paper on what is ΔTEC. "Residuals" of what with what? What is shown at the ordinate in Fig. 4? It is shown as TEC in TECU, but the values are typical for some difference. Is it really ΔTEC? I hope it could be easily corrected and made more understandable.