

Reviewer comments to the paper by Canales et al. “Distinct long-term trends...”

The paper is dedicated to studying long-term trends in the critical frequency foF2 in the region of the Weddell Sea Anomaly (WSA) based on the vertical sounding observations at Argentine Island and Port Stanley stations located within that region.

The Introduction presents a brief description of the WAS event and previous attempts to study trends in the F2-layer parameters by various researchers. The hourly monthly medians of foF2 for 1960-2023/2019 are analyzed.

The authors illustrate the WAS effect in Fig. 2 comparing the diurnal variations in the foF2 medians for the analyzed stations and Syowa and Mawson stations located outside the WAS region.

The method of revealing long-term trends is the one used by many authors. The difference between the observed values of foF2 and its dependence on the MgII solar activity index and the Ap index was calculated. Linear regression between that difference and time was providing the sought for trend.

The comparison of charts of the correlation coefficient r between foF2 and combination of MgII and Ap in Fig. 3 demonstrates a visual difference between the stations within the WAS and outside it. The main difference is in the presence of high (>0.75) values of r at nighttime hours at the stations within WAS.

The main result of the study is shown in Fig. 4 in the form of charts with the foF2 trends as functions of the season and local time for all four stations. The charts demonstrate a complicated picture of regions with both positive and negative trends. The rest of the paper is dedicated to description of the features of the foF2 trend behavior in Fig. 4 at various locations and local times.

The principal conclusion is that WSA impacts significantly foF2 trends. For example, at Argentine Island, “... negative trends are observed during periods when the WSA is active...” The effect, although in weaker degree, is seen at Port Stanley.

It is found that “...the trends in foF2 show seasonal-diurnal variations ...during specific hours and months where the WSA is present”. No such variations are found for the two stations outside WSA.

I think that the paper presents an interesting step in consideration of a very important problem of ionospheric trends. I recommend the paper for publication with a minor revision.

My critical comments are as follows.

In Fig. 3 it is very difficult to read numbers at the ordinate. I recommend changing the step to 4 hours and make the letters larger.

Captions to Fig. 3: “Solid black line...”. In my understanding of English, it is a curve, but not a line.