Geophysical Research Abstracts, Vol. 9, 04884, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-04884

Problems of revealing of Long-Term Trends in the Ionosphere

K.Tukhashvili

Tbilisi State University, Pr. Chavchavadze, 3, 0128 Tbilisi, Georgia.
ktukhashvili@hotmail.com

The continuous increase of greenhouse gases (carbon dioxide, methane, etc.) in the atmosphere is expected to warm the troposphere but the cool the higher levels of the atmosphere, including the mesosphere and lower thermosphere. Many Scientifics agree with this theory, but some ones proposed, that they have a natural origin rather than an artificial one. The critical frequency of E and F2 layers (foE and foF2) depend on the SunâEURŹs zenith angle (Ï°) and activity, therefore, it is necessary to consider the parameters at constant Ï° and activity, for revealing manmade long-term trends. Principal contradictions remain in trends in the F2 region of the ionosphere, particularly in interpretation of the observed trends. The fact is that nobody from researchers have not considered foF2 at constant Ï°, they have taken noon values, but they change by season, therefore, a big error take place when calculate yearly average value of foF2. If long-term changes of the parameters fall within the error limits, revealing of trends is not possible. It is necessary to calculate foF2 at Ï°=const. Using of ionosphere parameters at Ï°=const and same activity makes the long-term trends independent of solar activity and zenith angle, decrease error when calculate yearly average value of parameters too. foE and foF2, calculated at Ï°=const have a semi-annual variations, therefore, it is necessary to display every point of the plot with its root-mean-square-error (ÏČ). Observed values of foE and foF2 parameters, calculated by our method from data of Moscow and Tbilisi coincide with theoretical ones within the error limits, i.e. do not observed the long-term trends. The analysis of ionosphere data by our method for several latitudes and longitudes assert or disclaim existence of the long-term trends, not caused by the variation of SunâEURŹs activity.