Geophysical Research Abstracts
Vol. 15, EGU2013-2918, 2013
EGU General Assembly 2013

Long-Term Trend in the Total Electron Content

Jan Laštovička
Institute of Atmospheric Physics, Aeronomy, Prague 4, Czech Republic (jla@ufa.cas.cz, +420 2 7276 2548)

Lean et al. (2011) analyzed global TEC maps over 1995-2010 and found a positive long-term trend in global TEC. For various values of solar EUV flux this trend was positive and for some it was large, which is not physically plausible; both foF2 and model-derived profiles of electron density support rather negative trend of TEC. The regional TEC trends of Lean et al. (2011) for Europe were even substantially more positive than the global trend. Therefore here we use some historical TEC data from Faraday rotation experiments (Italy) and foF2 data of three high-quality data European ionosondes over 1995-2010 in trial to resolve this puzzle. These data indicate rather no or very weak negative trend of TEC in this region in the past in maxima of cycles 21 and 22, but also no trend of foF2 over 1995-2010 compared with a negative trend in solar cycles 21 and 22. This means that the more positive trend in the ionosphere over 1995-2010 might be reality and particular feature of this period, i.e. the positive trends found by Lean et al. (2011) can be attributed just to the period 1995-2010 but they need not represent general trends. The situation is complicated by the fact that we are not sure what was real level of solar EUV/UV in the last deep and long solar minimum. Moreover, ionospheric data indicate that F10.7 is unable to describe the depth of the last solar cycle minimum.