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Two years ozone layer study at Kyiv-Goloseyev site by Dobson spectrophotometer

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Dobson spectrophotometer total ozone content (TOC) and Umkehr observations in Kyiv have been started for the first time in Ukraine in May, 2010. Joint team of scientists is providing TOC and Umkehr measurements in a new site registered in WOUDC as Kyiv-Goloseyev STN498 and with GAWID 'KGV' in the GAWSIS. The station has been included in Global Atmosphere Watch Program of the WMO as Regional GAW Station in 2010. The Dobson spectrophotometer D040 has been received from the Royal Meteorological Institute of Belgium. The results of almost two years observations at Kyiv-Goloseyev including comparison with satellite data are discussed. The relatively small TOC values were registered during the August 2010 wildfire in Russia. In 2011 very low TOC values close to 220 DU were observed in October, that shows mini-ozone hole conditions. The TOC value range differs for two years and was equal of 260 – 375 DU in 2010 and 225 – 390 DU in 2011 for the same period as 2010. The measurements show in general the standard season variations. However mean TOC values are lower than the data for 1972-2008 filter ozonometer measurements in Ukraine by about 20 DU. The standard deviation of TOC daily mean values obtained by Direct Sun measurements for KGV site is about 3.7 DU that corresponds to 1% data accuracy. The TOC data quality analysis was undertaken by comparison to Aura and Envisat satellites overpasses and model values for KGV site. Mean discrepancy values for OMI–Dobson are 6.0±17.9 DU, for SCIAMACHY–Dobson are 2.1±17.7 DU at direct Sun measurements in AD Dobson spectral line pairs. Therefore Dobson groundbased TOC values are underestimated in comparison to satellite measurements. However this discrepancy for SCIAMACHY data is small and not exceeds 1%, whereas in a case of OMI this systematic difference is higher and is about 2%. Results of the analysis have demonstrated reasonably good quality of the Kyiv-Goloseyev data at Direct Sun and Zenith Blue observations. During 2011 year more than 20 Umkehr observations have been provided when weather permits at KGV site. The Umkehr data were processed according standard procedure of WOUDC. The results of several ozone height profiles retrieval are discussed.

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