MONITORING OF TOTAL OZONE CONTENT(TOC) AT THE IAP GROUND-BASED STATION, KISHINEV(MOLDOVA)

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Results of long-term measurements of total ozone content(TOC) at the IAP's ground-based solar radiation monitoring station for the period of observations from 2004 to 2016 are presented. In 2003 for the first time in Moldova the IAP's ground-based station (47.0013°N, 28.8156°E; 205 m a.s.l.) for monitoring solar radiation, aerosol optical properties and total ozone content was created [1]. The station was registered in the Global Atmosphere Watch Station Information System (GAW SIS) as a Regional fixed station in WMO RA VI–Europe (https://gawsis.meteoswiss.ch/GAWSIS//index.html#/search/station/stationReportDetails/353). Data on total ozone content X and UV solar radiation are submitted to the World Ozone and Ultraviolet Radiation Data Centre (WOUDC) GAW WMO http://www.woudc.org/contributors/?id=ASM-ARG&lang=en on regular basis since 2003. The IAP ARG station has register number STN455 ARG.

Measurements of TOC in the column of atmosphere have been regularly carrying out with hand-held narrowband filter ozonometer MICROTOPS II (Solar Light Co) at the ground station [2,3]. The instrument is equipped with the highest grade and long stability filters with ion-beam assisted deposition centered at λ= 305.5, 312.5, 320, 936 and 1020 nm. Combined time-series of yearly means of TOC $<X>_y$ measured at the IAP ARG ground-based station in the course of period from 2004 to 2016 and retrieved from observations on satellite platforms Nimbus7 (1979-1992), TOMS EP (1997-2004) and OMI AURA (2005-2016) is shown in Fig.1.

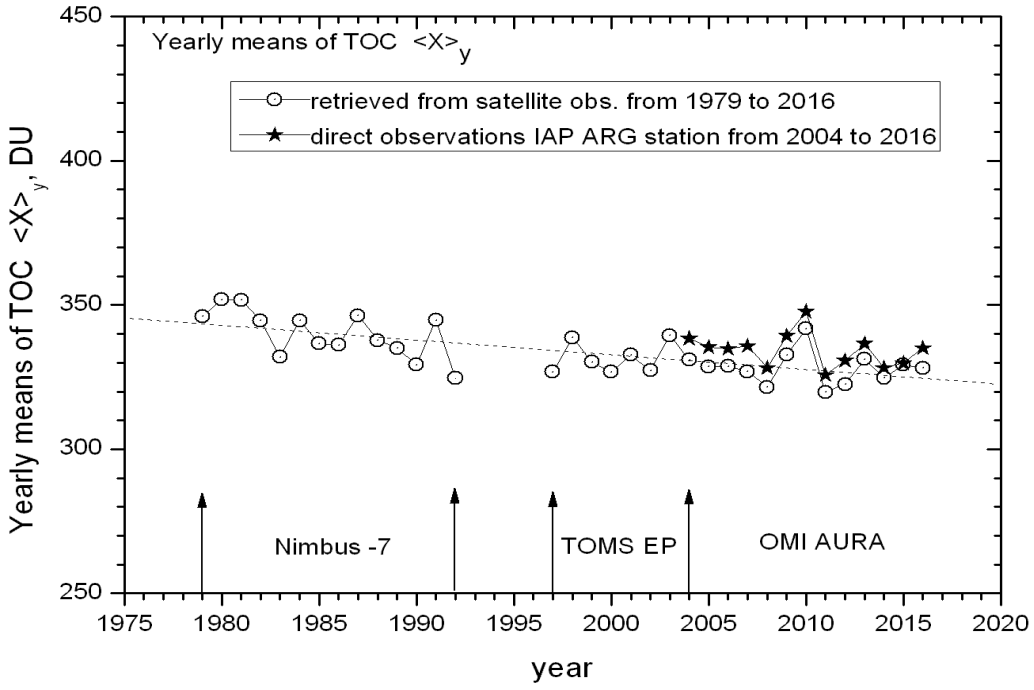

Figure 1. Combined time-series of yearly means of TOC $<X>_y$ measured at the IAP ARG ground-based station in the course of period from 1979 to 2016. The line approximation of multi-year variability of TOC is marked as dashed line.

Multi-year TOC trend for ARG ground-based station consists of value ~-5.1 DU per decade and it is shown as dashed line on Fig. 1. Seasonal variation of multi-year mean TOC $<X>_{m, MY}$ is shown in Fig 2. It is clear seen the presence of maximum of TOC in March with $<X>_{m,MY}$=374.6 DU and minimum of TOC in October with $<X>_{m,MY}$=288.2 DU.

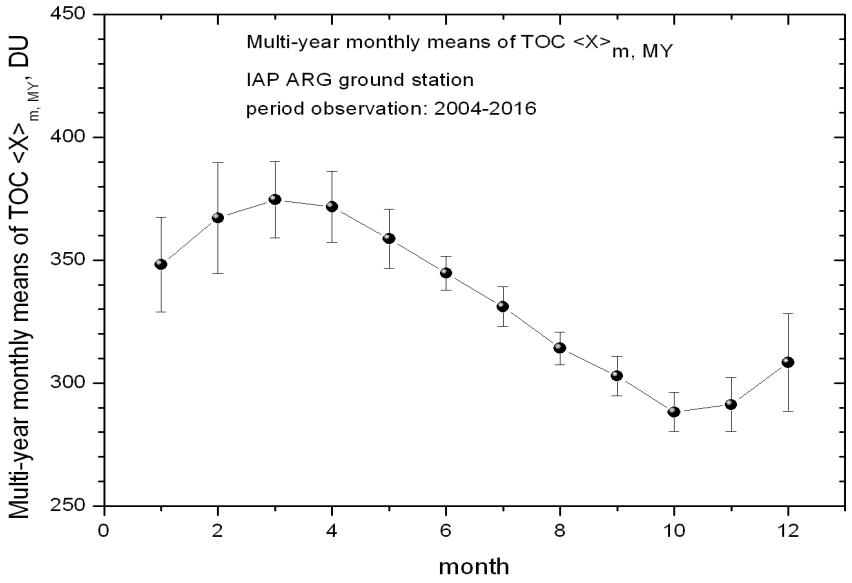

Figure 2. Seasonal variation of the multi-year monthly means of TOC $<X>_{m, MY}$ measured at the ground-based station at the Kishinev site in the course of period from 2004 to 2016.

Climatic norm from direct observations at the ARG ground-based station is $X_{cl,ARG}$=334.3±5.9 DU for period from 2004 to 2016 and climatic norm retrieved from combined observations on satellite platforms Nimbus7, TOMS EP and OMI AURA consists of value $X_{cl,satel}$=333.8±8.6 DU for period from 1979 to 2016. Extreme values of TOC from direct observations at the IAP ARG station and TOC retrieved from observations on satellite platforms Nimbus7, TOMS EP and OMI AURA are presented in Table 1.

Table 1. Extreme values of TOC from direct observations at the IAP ARG station (2004-2016) and TOC retrieved from observations on satellite platforms Nimbus7 (1979-1992), TOMS EP (1997-2004) and OMI AURA (2005-2016).

	min{X}	max{X}
Nimbus7 +TOMS EP + OMI AURA		
year	320 DU (Y2011)	351 DU (Y2010)
month	272 DU (Nov./2011)	426 DU (Feb./1985)
day	209 DU (Dec. 01, 1998)	532 DU (Mar. 03, 1998)
IAP ARG ground-based station		
year	326 DU (Y2011)	348 DU (Y2010)
month	268 DU (Nov./2014)	403 DU (Apr./2010)
day	240 DU (Nov. 16, 2008)	489 DU (Feb. 12, 2004)

References:

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2. Aculinin A., *Moldavian J. of Phys. Sci.*, 2006, 5(2), 240-248.
3. Aculinin A. , Smicov V, *Moldavian J. of Phys. Sci.*, 2006, 5(3-4), 387-395.