

HUNGARY

OBSERVATIONAL ACTIVITIES

In Hungary monitoring and research of ozone and UV-B solar radiation are mostly performed by the Hungarian Meteorological Service (HMS) in the Observatory of Atmospheric Physics in Budapest. HMS has long term data series and scientific experiences in this field. The operative column measurements of ozone and the high resolution UV spectra measurements were carried out by Brewer spectrophotometer without any data loss during this two year period. Results of measurements were inserted into the data base.

HMS runs a broad band UV radiometer network consisting of four stations. This network performed continuous, proper measurements and data measured were archived in the data base. There are seven UV-B radiometers operated by the ten regional environmental inspectorates as well. There is an intention to combine these two networks.

HMS satisfied the international data reporting commitments.

CALIBRATION

Monthly routine tests of the Brewer spectrophotometer towards the three standard source of radiation given by the manufacturer were carried out. Tests towards inner sources of radiation as well as tests controlling mechanic and electronic characteristics of the spectrometer were also carried out and archived. Test results show no problem.

In May, 2007 biannual calibration of the Brewer spectrophotometer towards the world standard Brewer operated by the International Ozone Service in Canada. During the calibration all parameters indicated good performances. Only one minor modification had to be done with one of the parameters.

Calibration of network detectors of the broad band UV radiometer network was carried out in both years. Before each calibration the national reference detector was checked towards the Brewer spectrophotometer.

The national reference detector was calibrated in the World Radiation Centre (Davos, Switzerland) in the framework of COST 726 action („*Long term changes and climatology of UV over Europe*”).

UV FORECAST

In 2006 and 2007 daily 24 hour forecast of the maximal UV-B dose was prepared in the period of 1 May to 30 September. The forecasted values were visualised on maps on the website operated by the Hungarian Red Cross (www.napsugarzas.hu). Result of a development in 2007: not only the forecasted values but the hourly values measured on that day can be seen as well on the website in near-real-time manner.

INTERNATIONAL CO-OPERATION

(1) COST 726 („*Long term changes and climatology of UV over Europe*”):

The program started in 2004 and is going to finish in 2009. HMS participated in three important activities in this EU action during the last two years:

(i) Co-operation in writing the paper: *Practical Guide to Operating Broadband Instruments Measuring Erythemally Weighted Irradiance*. This work accomplished successfully, the publication was issued at the beginning of 2007.

(ii) Calibration of broad band UV detectors in the World Radiation Centre, Davos.

The Working Group 4 of COST 726 together with the WMO Scientific Advisory Group for UV Measurements is developing the Standard Operating Procedure (SOP) for the broad band UV measurements. Main goal of the Working Group to harmonise the work of national and regional networks doing erythemally weighted UV radiation measurements. In this activity calibration of UV detectors designated as regional reference towards the WRC's reference is essential. HMS took part in calculation of calibration related to each detector.

(iii) HMS produced and made available the homogenised global radiation data series of Budapest for the modelling work of COST 726 (restoration of UV data series for the past).

(2) EU FP7 framework program:

HMS participated in the work of a consortium consisting of 11 institutes from 9 countries elaborating a proposal for the tender in autumn 2007 in the framework of EU FP7 „*Quantification of changing surface UV radiation levels and its impact of human health*”. The preparation work started at the end of 2007 and the proposal was submitted in due time (25 02 2008) with the title „*UV radiation at European level and its impact on human health: an European UV atlas*”.

OTHER ACTIVITIES

In 2006 collaboration of experts from different fields (atmospheric physics, dermatology, ophthalmology, biophysics, radiation biology, sociology, public health, labour safety) having relation to UV radiation intensified. First the work was organised in an academic working group. However, according to the rules of the Hungarian Academy of Sciences does not enable operation of an interdisciplinary working committee, it is possible only for certain disciplines. After a longer preparation period HMS houses the working committee.

The first relevant work is professional secondment of the related activities of the Hungarian Red Cross. One of them is education on the right protection forms against the harmful UV radiation. There were many presentations on this topic and an instructor CD was made for schools.

Another one is a summer program, operation of two UV radiation first aid stations at the Lake Balaton by the Hungarian Red Cross for two months. The personal UV dosimeters used experimentally here were calibrated by HMS.

Experts from HMS attended the „*10th Biennial Brewer Users' Group Workshop*” in Northwich (Cheshire, UK) in June, 2007. This biannual event deals not only with the Brewer spectrophotometer, but general UV spectrometric és spectroscopic theoretical and technical questions as well.

PUBLICATIONS

Hídvégi, Sz., Rácz, F., Tóth, Z, Nándor, S., 2006.: Relationship between the variability of maize-pollen and quality of crop. *Cereal Research Communications*, Vol. 34, No. 1/II, 477-480.

Kaskaoutis, D. G., Kambezidis, H. D., Tóth, Z., 2007.: Investigation about the dependence of spectral diffuse-to-direct-beam irradiance ratio on atmospheric turbidity and solar zenith angle. *Theoretical & Applied Climatology*, 89, 245-256 (2007).

Tóth Z, 2007.: A légtör napsugárzás átbocsátása. *Beszámoló az OMSZ 2006. évi tevékenységéről. OMSZ kiadvány. 92-116.*

Tóth Z. 2007: Védőpajzsunk és mérgeünk: az ózon. *Természetbúvár*, 2007/5., 10-12.

Hídvégi Sz., Rácz F., Tóth Z., 2007: Az UV sugárzás hatása a hibridkukorica, valamint a beltenyésztett szülői vonalak pollenjének életképességére. *Acta Agromica Óváriensis (IN PRINT).*

Tóth Z, 2008.: Az elektromágneses sugárzás hatása az emberi szervezetre. *In: Emberpróbáló időjárás (Orvosmeteorológia mindenkinek). Athenaeum kiadó, 70-112.*

PRESENTATIONS

Tóth Z.: Az ultraibolya sugárzás egzakt mérés technikája
MTA Szociológiai Kutató Intézet, tudományos ülés, 2007. jún. 28.

Tóth Z.: Elektromágneses sugárzások biológiai hatékonysága, különös tekintettel az ultraibolya tartományra
OMSZ belső továbbképzés, 2007. okt. 3. és 17.

Tóth Z.: A légköri ózon és a biológiailag hatékony ultraibolya sugárzás kapcsolata
MMT előadás, Debreceni Egyetem, Debrecen, 2007. okt. 9.

Tóth Z.: Mennyire káros a káros ultraibolya sugárzás?
Bajai Városi Könyvtár előadás sorozata, Baja, 2007. nov. 28.
