

QOS2016-107, 2016

Quadrennial Ozone Symposium of the International Ozone Commission

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UVI Network for Southwestern Spain

A. Serrano (1,2), M.L. Cancillo (1,2), J.M. Vilaplana (3), J.A. Bogeat (3), G. Sánchez (1,2), A.A. Piedehierro (1,2), and F.J. Alonso (4)

(1) Department of Physics, University of Extremadura, Badajoz, Spain (asp@unex.es), (2) University Institute for Water, Climate Change and Sustainability Research, University of Extremadura, Badajoz, Spain, (3) Atmospheric Observatory "El Arenosillo", Atmospheric Research and Instrumentation Area, National Institute for Aerospace Technology, Huelva, Spain, (4) Department of Mathematics, University of Extremadura, Badajoz, Spain

Monitoring the solar ultraviolet (UV) radiation crossing the atmosphere and reaching the Earth's surface is of the utmost importance due to its adverse effects on human health as well as on ecosystems. These effects can be particularly intense in certain areas of Southern Europe, where daily accumulated UVI can be extremely high mainly during June and July. Since some of the most influencing factors which modulate the solar radiation, such as cloudiness, aerosols and, occasionally, ozone, show high spatial and temporal variability at different scales, regional dense networks are needed to provide local information on a small spatial scale.

In response to the mentioned demand, a regional network for measuring the UV radiation in Southwestern Spain has been deployed. This network is operated by the University of Extremadura (UEx) and the National Institute for Aerospace Technology (INTA), and covers an area of more than 70000 km². It consists of eleven stations at the locations of Badajoz, Cáceres, Plasencia, La Covatilla, Fuente de Cantos, Orellana la Vieja, El Arenosillo, Alcalá de Guadaira, Córdoba, Algeciras and Marbella. Different altitudes are represented, from El Arenosillo at near sea level to La Covatilla at almost 2000 m. Closest stations are about 100-150 km distance between them in average. The locations were selected so as to be representative also for different environments such as high altitude areas and coastal or interior locations.

Total and UV erythemally-weighted irradiances are continuously measured at all stations belonging to the network. For this aim CMP11 and UV-S-E-T radiometers manufactured by Kipp & Zonen are used. The CMP11 pyranometers have been calibrated against a common reference to provide comparable measurements. Additionally UV-S-E-T radiometers are calibrated every two years against the Brewer #150 spectrophotometer, which is periodically calibrated using the QASUME unit as reference.

Every twenty minutes the measurements from all stations are sent to a common server at Badajoz site, where they are processed and the UVI index is calculated for each location. This information is disseminated at nearly real time to the public through the web page <http://aire.unex.es/uvi> developed for this specific aim. The web page also provides information about foreseen UVI values for the present day and the day after as simulated by SBDART radiation transfer code with total ozone content predicted values, and aerosols and albedo typical values for the region as input values.

This initiative is promoted by the Ministerio de Economía y Competitividad of Spanish Government under contracts CGL2011-29921-C02 and CGL2014-56255-C2-R.