EMS Annual Meeting Abstracts
Vol. 12, EMS2015-25-3, 2015
15th EMS / 12th ECAM

The SOLEA Project: nowcasting solar energy spectra and UV products

Panagiotis Kosmopoulos (1,2), Michael Taylor (1), Stelios Kazadzis (3,1)

(1) Institute for Environmental Research and Sustainable Development, National Observatory of Athens, Greece, (2) Faculty of Applied and Environmental Physics, Aristotle University of Thessaloniki, Greece, (3) Physikalisch-Meteorologisches Observatorium Davos, World Radiation Center, Switzerland

We present an overview of a new research project for the development of solar energy applications (SOLEA) based on solar irradiance spectra produced via a synergy of neural networks and radiative transfer simulations. Surface spectra for the direct normal, global horizontal and diffuse horizontal irradiance (DNI, GHI and DHI respectively) are produced at high resolution (1nm, 0.05 x 0.05 degrees, 15-min) using input data acquired from the Spinning Enhanced Visible and Infrared Imager (SEVIRI) onboard the Meteosat Second Generation 3 (MSG3) satellite. Local or regional maps of the total DNI, GHI and DHI serve high precision solar power applications. Maps of UV products, including the UV index and the Vitamin D effective dose derived from the spectra, serve health, outdoor leisure and environmental protection end-users. Cross-validation with other models and ground-based measurements, and a sensitivity analysis to atmospheric parameters, has been performed to guarantee the quality and accuracy of our products.