



Spatial interpolation of solar global radiation

C. Lussana (1), F. Uboldi (2), and C. Antoniazzi (1)

(1) ARPA Lombardia, Servizio Meteorologico Regionale, Milano, Italy (c.lussana@arpalombardia.it), (2) Consultant, Novate Milanese, Milano, Italy (uboldi@magritte.it)

Solar global radiation is defined as the radiant flux incident onto an area element of the terrestrial surface. Its direct knowledge plays a crucial role in many applications, from agrometeorology to environmental meteorology.

The ARPA Lombardia's meteorological network includes about one hundred of pyranometers, mostly distributed in the southern part of the Alps and in the centre of the Po Plain.

A statistical interpolation method based on an implementation of the Optimal Interpolation is applied to the hourly average of the solar global radiation observations measured by the ARPA Lombardia's network.

The background field is obtained using SMARTS (The Simple Model of the Atmospheric Radiative Transfer of Sunshine, Gueymard, 2001). The model is initialised by assuming clear sky conditions and it takes into account the solar position and orography related effects (shade and reflection).

The interpolation of pyranometric observations introduces in the analysis fields information about cloud presence and influence.

A particular effort is devoted to prevent observations affected by large errors of different kinds (representativity errors, systematic errors, gross errors) from entering the analysis procedure.

The inclusion of direct cloud information from satellite observations is also planned.