

Study the Error Distribution in Solar Irradiance
and Ground-Based Surrogates

A. Vigouroux (Observatoire de la Cote d'Azur, B.P. 229,
06104 Nice cedex 04, FRANCE; (33)92-00-30-18;
vig@rossini.obs-nice.fr)

J. M. Pap (Jet Propulsion Laboratory, California Institute of
Technology, MS 169-506, 4800 Oak Grove Dr., Pasadena, CA 91109,
818-354-2662; jpap@jplsp2.jpl.nasa.gov)

Abstract

Analyses based on irradiance observations from space within the last one and a half decades have discovered variations in the entire solar spectrum anti at UV wavelengths on time scales of minutes to decades. Although considerable information has been gathered on the observed irradiance changes, it has become clear that there is a residual irradiance variability which is not explained by sunspots, faculae/plages and the magnetic network. Because of the lack of quantitative physical models of the solar radiative output, the current models have been developed with simple linear regression analysis which is not capable to distinguish between periodic or seasonal irradiance components and their error-terms. The main goal of this paper is to estimate the degree of significance of the observed variations in solar total and UV irradiances and their magnetic surrogates and to provide irradiance estimates containing only the significant solar components. The results of error distribution (both instrumental and solar noise) in solar irradiance and its ground-based surrogates are presented in this paper.