The influence of cloud cover index obtained from satellite data on accuracy of solar irradiance estimates

F. R. Martins(1), E. B. Pereira(1), S. L. Abreu(2)

(1) Center of Weather Forecast and Climatic Studies/Brazilian Institute of Space Research, São José dos Campos, Brazil, (2) Solar Energy Laboratory/University of Santa Catarina, Florianópolis, Brazil (fernando@dge.inpe.br / Fax: +55 12 39456810)

Cloud cover index (*CCI*) is a very important input data for radiative transfer models and great effort is being made to its determination from satellite images with high confidence. The influence of *CCI* on solar radiation assessment becomes evident in large continental areas such as the Brazilian territory, with a wide range of climatic environments. This work describes two techniques to obtain *CCI* information using channel 1 (visible) and channel 4 (infrared) data from GOES satellite in order to maximize the reliability of *CCI* evaluation. The techniques are based on statistical and geometry analyses for each pixel of satellite data. This work also presents a comparison among ground measurements and solar irradiation estimates provided by the model BRASIL-SR using *CCI* data obtained with both techniques and with the threshold methodology. The ground data were provided by two BSRN site located in Florianópolis (South of Brazil) and in Balbina (Brazilian Amazon region). The SWERA (Solar and Wind Energy Resources Assessment project) site, located at Caicó/PE in Northeast of Brazil, is the third spot used to the comparison. The MBE was reduced up to 66% and the RMSE was decreased up to 50% due to implementation of the new techniques. The correlation factor among measured and estimated values of surface global solar irradiation increased 50% when new techniques were used to get CCI values.