

Space Studies of the Earth's Surface, Meteorology and Climate (A)
Atmospheric Remote Sensing: Surface Layer, Troposphere, Stratosphere and Climate (A11)
Consider as poster only.

SOLAR ENERGY RESOURCES AT SOUTH REGION OF BRAZIL

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The Center for Weather Forecast and Climate Studies at the Brazilian National Institute for Space Research, Ministry of Science and Technology - CPTEC/INP-MCT, have installed throughout Brazilian territory several sites to acquired solar irradiation data used to assess the renewable energy potential of Brazil as part of SONDA project (www.cptec.inpe.br/sonda/). One of ground sites is located at the Southern Space Observatory-SSO/CRS/CIE/INPE-MCT, (29°S; 53°W), in São Martinho da Serra, RS, South of Brazil, where diffuse and global solar irradiation are measured by CM 22 and CM21 Pyrhanometers), direct solar radiation are measured by Pyrheliometer NIP and opaque and thin cloudiness fractions were esteemed by a Total Sky Imager TSI-440 (YES, Inc). Our concern is with the fact that the current world energy scenery, characterized by petroleum sources exhaustion and environmental concerns, point out to the use of clean and renewable energy sources such as the solar energy. This work aims to the evaluation of the solar energy resource by using stochastic models relating the cloud cover fraction and solar radiation parameters such as diffuse-to-direct-beam ratio (DDB), diffuse-to-global solar irradiation ratio (K), diffuse-to-TOA irradiation ratio (K_D), and global-to-TOA irradiation ratio (K_T), measured with the SONDA Project, where TOA is the total irradiation that reach the atmosphere. Only data collected for zenithal solar angle (SZA) lesser than 75

deg for the period between September/2005 to September/2007 were used. The ground data were averaged for fifteen minutes intervals in order to reduce the influence of high frequency variability of cloud cover. It was observed low correlation (around 0.55) among the diffuse to TOA irradiation ratio and cloud cover. Better correlation (about 0.94) were obtained for K parameter. The statistic deviations RMSE (23-28%) and MBE (0.3-5%) were calculated to validate and compare the models performance. The results showed more influence from opaque cloudiness on radiation scattering. The estimates provided by these empirical models were compared to the Brazilian Atlas for Solar Energy published in 2007.