

# DEVELOPMENT OF AN AUTOMATIC SOLAR RADIATION SPECTRAL DATA AQUISITION SYSTEM

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## ABSTRACT:

The Brazilian National Institute for Space Research - INPE develops a study aiming at the assessment the spectral efficiency of photovoltaic modules in Brazil. For this study an automatic system for spectral data measurement and data acquisition was setup along with several PV panels of distinct technologies. The data are collected by an optical interface for outdoor application. This system consists of an Polytetrafluoroethylene (PTFE) diffuser protected by quartz dome installed in an aluminum housing. An entry mirror provides coupling between the optical input and an optical fiber with a length of 25m (NA = 0,22), which takes the signal to a CCD spectrometer (GetSpec 2048). This system is driven by an electronic circuit mounted in a platform called Arduino. The data is sent via RS232 cable to a PC , at an average of ten measurements every hour for a total of ten daily retrievals.. The angular error of the optical interface is 5% up to 45° and the system was calibrated between 250 and 1100nm using a FEL-NIST lamp of 200W (model number 63355). The system has been operating in the INPE's division of Cachoeira Paulista since February 2015.

## REFERENCE:

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- [2] Berni, L. A., Vilela, W.A., Beloto, A.F., Sena, F.O. System for measuring the angular response of radiometers. Proceedings of SPIE, Vol. 8785, p. 5 , 2013.