



Monitoring cloud fraction in Florianópolis (Brazil) using an all sky camera system.

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This work describes the development and application of a method for mapping automatically the fraction of the sky covered by clouds. The method was carried out in the Baseline Surface Radiation Network (BSRN-WMO) station located at the Laboratory for Solar Energy – LABSOLAR - Federal University of Santa Catarina (Florianópolis, 27° 28'S, 48° 29'W). Data acquisition period was from March 2002 to February 2003 from 8:45 (UT) to 21:00 (UT), with images collected daily every 15 minutes. A full year of cloud fraction and associated solar radiation data (March 2002-March 2003) was analyzed and reviewed in this paper along with a short description of the system.

A Pixera model PCS20232, digital camera operating in the visible range of the solar spectra composes the system. The camera was mounted aiming at the zenith on a platform equipped with a shadow disk controlled by a motorized solar tracking system. A wide angle lens (Nikon, FCE8) with a nominal opening of 178° was adapted to the objective aperture. The system supplied images with resolution of 600X600 pixels in the JPEG format (Joint Photographic Expert Group). The images were obtained in the RGB (Red, Green, Blue) color system and then converted to the IHS (Intensity, Hue, Saturation) system before processing. The analysis employed the saturation (S) to infer the level contamination of pixels by clouds and thus the cloud fractions. The classification was carried out utilizing a user-friendly graphic interface developed for MS Windows.