



The solar irradiance registered at a flat- hemispherical field of view- bolometric oscillation sensor on board PICARD satellite

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The value of the Total Solar Irradiance (TSI) is varying over the 11-year sunspot cycle. The cycle amplitude is about 0.1% solar constant, which could be traced with the absolute radiometers onboard dedicated space missions. The operating principle of the absolute radiometer is measuring the electrical heating power of the heat sensing unit during the closed and opened phase of each measurement cycle. The difference between the power integrated cross the closed phase and the power integrated cross the open phase gives the value of the solar irradiance. The cadence of the measurement is usually from one to several minutes. The final TSI value in physics unit is obtained after taking into account the electronic calibration, correction of the instruments effects, and normalizing to 1 AU.

The Bolometric Oscillation Sensor on board PICARD microsatellite is a new designed remote sensing instrument. The BOS is operated continually with a 10 seconds cadence to fill the time gaps between open and close phases of the SOVAP absolute radiometer. The BOS has two sensing surfaces, the main one with a light mass is black coated, the second surface is white painted with a heavier mass. The sensor has a hemispherical field of view. The heat flux absorbed by the main detector is thermally conducted by a thin shunt to the heat sink. The principle of the measurements is that the sum of the power of the blacked coated surface and the power along the shunt is equal to the incoming electromagnetic radiation. However as the BOS has a HFOV, the incoming radiation caught by it, has three kinds of origin: the solar irradiance, the reflected solar visible light form the Earth and the terrestrial infrared radiation. In this work, we are going to discuss the solar irradiance isolated from the measurements of the BOS instrument as well as the comparison with the sunspot number and the TSI composite from the VIRGO/SOHO and TIM/SORCE experiments.