

Study between atmospheric parameters and pyranometer global radiation measurements at São Paulo, Brazil

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Abstract: According to the recently released report of the Intergovernmental Panel on Climate Change (IPCC) on August of 2021, the well-mixed greenhouse gas (GHG) concentrations have continued to increase in the atmosphere, reaching annual averages of 410 ppm for CO₂, 1866 ppb for CH₄, and 332 ppb for N₂O. The GHGs can contribute to warming the atmosphere up to 2.0°C, while aerosols can contribute to cooling up to 0.8°C. In this context, it is increasingly important to monitor the global solar radiation flux incident on the atmosphere. The pyranometer instrument is designed to measure the solar radiation flux density (W/m²) and it can be used to get information about the amount of radiation incident on the ground and how much of this radiation is absorbed or scattered. The aim of this work is to show preliminary results retrieved by a pyranometer installed in the SPU Lidar Station, in São Paulo-Brazil, and how the global solar radiation can be correlated with other atmospheric parameters retrieved from AERONET sunphotometer and meteorologic stations, such as the aerosol optical depth (AOD), cloud cover, relative humidity, in order to quantify the aerosol influence in the process of atmospheric radiation and climate change.

Keywords: pyranometer; solar radiation; sunphotometer, AERONET, allsky camera, clouds.

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