Abstract

This paper aims to analyze the influence of internal factors in the sun and Earth’s atmosphere, represented by the International Sunspot Number and cloudiness, respectively, in the value of the clearness index, given by the relation between the incident radiation on the surface and at the top of the atmosphere, over a solar cycle, for the city of Fortaleza. The data of insulation hours and cloudiness were obtained from the National Institute of Meteorology and the International Sunspot Number from the Sunspot Index and Long-term Solar Observations. From these data, we calculated the annual average clearness index using the Ångstrom-Prescott equation and a comparison was made with the average cloudiness and the solar activity. The results showed a great influence by the cloudiness (-0.808) and very little by the solar activity. However, it also shows that the clearness index (0.187) presents in most of the cycle a behavior similar to that of solar activity.

References


Index Terms

Computer Science

Information Sciences

Keywords

Clearness index, Cloudiness, Solar activity, Ångstrom-Prescott equation