

Short Term Effects of Solar Activity on Incoming Short Wave Radiation

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Abstract

It is well known that sunspots and solar activity works on an 11-year and 22-year cycle. The body of this thesis will focus on daily, weekly and monthly variations in solar activity and the impact this variation has on shortwave radiation received at the surface of the Earth. This will be accomplished using data provided by NASA and the Solar & Heliospheric Observatory, for information on solar activity and Western Connecticut State University's radiometric laboratory. Data will be collected daily and analyzed on a daily, weekly and monthly basis in an attempt to develop a correlation between the life-cycle of a sunspot and the total solar irradiance. Calibration equations will be used to alleviate the affect atmospheric interference will have on the incoming shortwave radiation data received at the surface. With the results of the data analysis, this thesis could be used to develop a greater understanding of how varying solar energy affects the Earth's energy budget and climate intraseasonally. The results of this thesis could also assist in the development of a more efficient solar panel, that will collect and store energy based off of observed sunspot activity.