Registration Form

TEAM INFORMATION

Team Name/Project Title: Solar Simulator

Department: MECH, ELEC, LA-ARCH-MURP

Faculty Advisor(s): Dr. P.E. Jenkins and Leila Tolderlund

Team Members: Abdulaziz Almusaiid, Kimberly Buchanan, Kimberly Hoskins, Timothy WesselIn, Vincent Van Zago

PROJECT INFORMATION

Description:

Our project is a solar simulator that emulates sunlight in order to test photovoltaic panels that are used in the other interdisciplinary projects.

Abstract:

Our project is a solar simulator that will emulate sunlight in order to test photovoltaic panels that are used in the other interdisciplinary projects. Solar simulators are used to test photovoltaic panels because the qualities of actual sunlight vary on a day to day basis depending many variables that are not within our control. The purpose of the solar simulator is to imitate ideal conditions for solar testing so that precise and accurate results can be obtained in any conditions. The challenge of designing and implementing a solar simulator is in creating artificial light that accurately mimics sunlight. Solar Simulators are rated based on their spectral match, spatial uniformity, and temporal stability. In order to best meet these ratings it is, important to choose a light source that matches the light produced by the sun and produces a total irradiance of $1000 \frac{W}{m^2}$. The ambient light produced by the lamp is diffused into a uniform beam and onto the target working area. In order to accomplish this, fabricated reflectors are used to capture the light and focus the light through the diffuser. Once the light is properly focused onto the photovoltaic panel, the spatial uniformity, temporal stability, irradiance, and spectral match can be determined. Our project yields an effective solar simulator that can be used for accurate testing by the other interdisciplinary senior design projects.