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RoLEDS: Rotating LED-based Solar Simulator[1] NICKOLAS REED, PARKER STOKES, PRATHEESH JAKKALA, Illinois College — This study reports the design and construction of an innovative, efficient, and low-cost arduino based solar simulator. The simulator produces a spectrum of wavelengths for I-V, efficiency measurements of solar cells and other photosensitive devices. Visible solar spectrum can be simulated using rotating LEDs. Sample overheating and uniform distribution of light sources over the sample area is addressed by the rotational aspect of the design. RoLEDS is controlled by Arduino motor drive module. The power output of the light source in the RoLEDS can be adjusted when Arduino sends the information to the computer interface. Wavelength filters are used to measure light generated current and voltages at specific wavelengths. This low cost solar simulator can operate within 300 - 800 nm wavelength range. A comparison has been established with the existing branded solar simulators. Isc, Voc, Power, and Efficiency values of lab made and commercial solar cells measured using this simulator are within reasonable error to the true values.

[1]Mill's Experiential Learning Fund

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