

# SPECTRAL EVOLUTION

## PV Cell Development with a Spectroradiometer and RT Sphere

A UV/VIS/NIR spectroradiometer can be used to study and test the optical properties of different photovoltaic (PV) cell designs and coatings using a reflectance/transmittance (RT) sphere. To see the effect of sunlight striking a PV cell and compare the effects of different materials, textures, and coatings, a spectroradiometer with an RT sphere that can measure reflectance, transmittance, and absorption becomes indispensable.

PV cells convert sunlight to electricity. The first stage in this conversion is absorbance of light in the useful spectral range. Different treatments are used to increase film absorbance including antireflective coatings. The effectiveness of different designs and treatments can be compared by measuring reflectance, transmittance and absorption.

Spectral Evolution spectroradiometers cover the full UV/VIS/NIR range from 350-2500nm. An RT sphere allows you to collect all diffuse light reflected from a sample since the inside of the sphere is a perfect reflecting diffuser—total hemispherical reflectance can be measured. With the high resolution spectra obtained from a Spectral Evolution spectroradiometer, the RT sphere can deliver detailed information about the PV cell's spectral features.

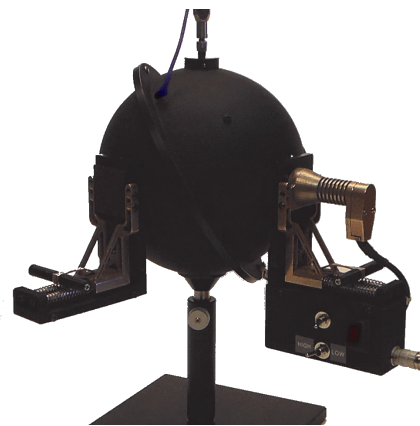
The RT sphere has as port plugs for single 9° beam geometry. A specular light trap is included for specular subtraction. The fiber optic is connected to the sphere at the top via an SMA-905 connector. The control panel on the sphere includes the on/off power switch, illumination selector (reflectance or transmittance), and illumination intensity selector (high/low). The sphere can be powered by the spectroradiometer. Easy-to-use and secure sample holders are provided.

The Spectral Evolution RT sphere is 6" in diameter and is small enough to take anywhere. It includes a stand as well as a 1/4-20 mount boss for use with any mini or standard size tripod.

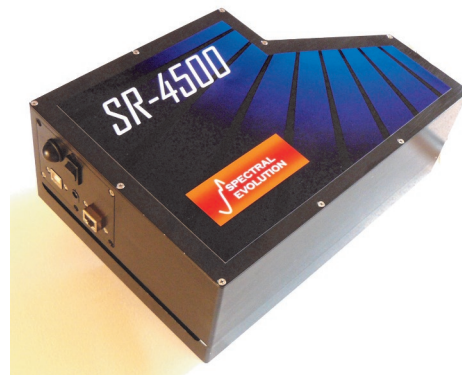
Spectral Evolution spectroradiometers are equipped with DARWin SP data Acquisition software. DARWin SP includes pull down menus for solar simulator evaluation to AM1.5 and AM 1.0 and an energy measurement window that calculates integrated radiance or irradiance over a user-determined wavelength band for the spectrum of interest. DARWin SP saves all spectra and associated data as ASCII for use with other commercial or home-grown analysis software.

The RT sphere can be connected to any of our portable spectroradiometers, including the SR-4500 which features three thermoelectrically-cooled photodiode arrays for the ultimate in stable performance.

Contact us today for additional information: [sales@spectralevolution.com](mailto:sales@spectralevolution.com)



*RT Sphere can measure reflectance, transmittance, and absorption.*



*The SR-4500 lab spectroradiometer provides the ultimate in high performance and stable operation with three TE-cooled photodiode arrays,*

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