

SPECTRAL EVOLUTION

Measuring Direct, Diffuse and Global Irradiance

Direct and diffuse solar irradiance are important components of environmental and climate research. Direct solar irradiance is the solar radiation that passes directly through the atmosphere from the sun without being scattered or absorbed by the atmosphere. Diffuse solar irradiance reaches the ground and has been scattered by an atmospheric component such as air and water molecules, dust, or clouds. Measurement of direct and diffuse solar irradiance can provide information on the transformation of energy on the earth and in the atmosphere, analysis and distribution of the properties of atmospheric components and verification of satellite measurements of radiation.

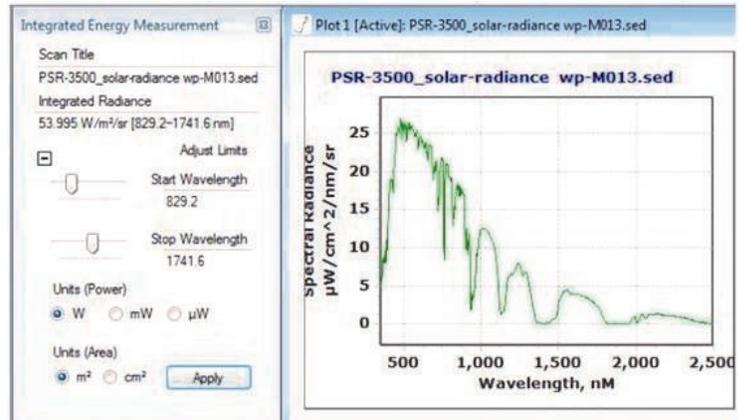
Global (downwelling) solar irradiance is the total amount of solar irradiance on an upward-facing horizontal surface and is the sum of the direct and diffuse solar irradiance. The global solar irradiance provides information on the total radiance that affects the earth's weather and climate system and can be used in the study of climate change.

A SPECTRAL EVOLUTION field spectrometer such as the PSR+, SR-6500, RS-5400, RS-8800, RS-3500 or SR-3500 can be used to measure global, direct and diffuse solar irradiance. Ground based measurement provides advantages such as high spectral resolution and the ability to adjust optical alignment of the measurement apparatus and target. The PSR+ with a cosine corrected diffuser measures global irradiance. A PSR+ with a Gershun tube measures direct irradiance and the diffuse irradiance is calculated from this measurement.

DARWin SP Data Acquisition software which comes with every SPECTRAL EVOLUTION instrument provides a tool accessed by a pull-down menu, for measuring energy. The pull-down utility allows users to calculate integrated energy levels as a function of wavelength interval (user adjustable).

SPECTRAL EVOLUTION spectroradiometers provide:

- ◆ Fast, full-spectrum UV-VIS-NIR measurements – 350-2500 nm with just one scan
- ◆ Superior reliability in the field with 100% diode array optics with no moving parts
- ◆ Bluetooth interface – ditch the rats nest of cables
- ◆ Lithium-ion rechargeable batteries for field use
- ◆ Lightweight and rugged
- ◆ Standalone operation – internal memory holds 1000 scans (PSR+)
- ◆ Optional ALGIZ 8X rugged handheld tablet for field use running DARWin LT on Windows 10 with digital camera, and GPS
- ◆ Field switchable optics for varying target sizes and measurement modes



A pull-down menu provides access to the integrated energy tool in DARWin SP data Acquisition software.



Gershun tube, in-line diffuser and right-angle diffuser.



Measuring global solar irradiance with a diffuser.

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