

irradiance (at a point of a surface), E

Radiant power, P , of all wavelengths incident from all upward directions on a small element of surface containing the point under consideration divided by the area of the element. SI unit is W m^{-2} .

Note 1: Mathematical definition: $E = dP/dS$. If the radiant power is constant over the surface area considered, $E = P/S$.

Note 2: Alternative definition: Integral, taken over the hemisphere visible from the given point, of the expression $L \cos\theta d\Omega$, where L is the *radiance* at the given point in the various directions of the incident elementary beams of solid angle Ω and θ is the angle between any of the beams and the normal to the surface at the given point.

$$E = \int_{2\pi} L \cos\theta \, d\Omega$$

Note 3: This term refers to a beam not scattered or reflected by the target or its surroundings. For a beam incident from all directions, *fluence rate* (E_0) is an equivalent term.

Note 4: $E = \int_{\lambda} E_{\lambda} \, d\lambda$, where E_{λ} is the *spectral irradiance* at wavelength λ .

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N.B. This supersedes an earlier definition.