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radiance, L

Radiant power, P, leaving or passing through a small transparent element of surface in a given direction from the source about the solid angle Ω, divided by the solid angle and by the orthogonally projected area of the element in a plane normal to the given beam direction, $dS_\perp = dS \cos\theta$

Notes:

1. Mathematical definition:

$$L = \frac{d^2P}{d\Omega\, dS_\perp} = \frac{d^2P}{d\Omega\, dS \cos\theta}$$

   for a divergent beam propagating in an elementary cone of the solid angle Ω containing the direction θ. SI unit is W m^{-2} sr^{-1}.
2. For a parallel beam it is the radiant power, P, of all wavelengths leaving or passing through a small element of surface in a given direction from the source divided by the orthogonally projected area of the element in a plane normal to the given direction of the beam, θ. Mathematical definition in this case: $dP / (dS \cos\theta)$ If the radiant power is constant over the surface area considered, $P / (S \cos\theta)$. SI unit is W m^{-2}.
3. Equivalent to $L = \int_\lambda L_\lambda d\lambda$, where L_λ is the spectral radiance at wavelength λ.

Source:

PAC, 2007, *79*, 293 *(Glossary of terms used in photochemistry, 3rd edition (IUPAC Recommendations 2006))* on page 408

