

Figure 2.1 Description of radiation interactions at a surface.

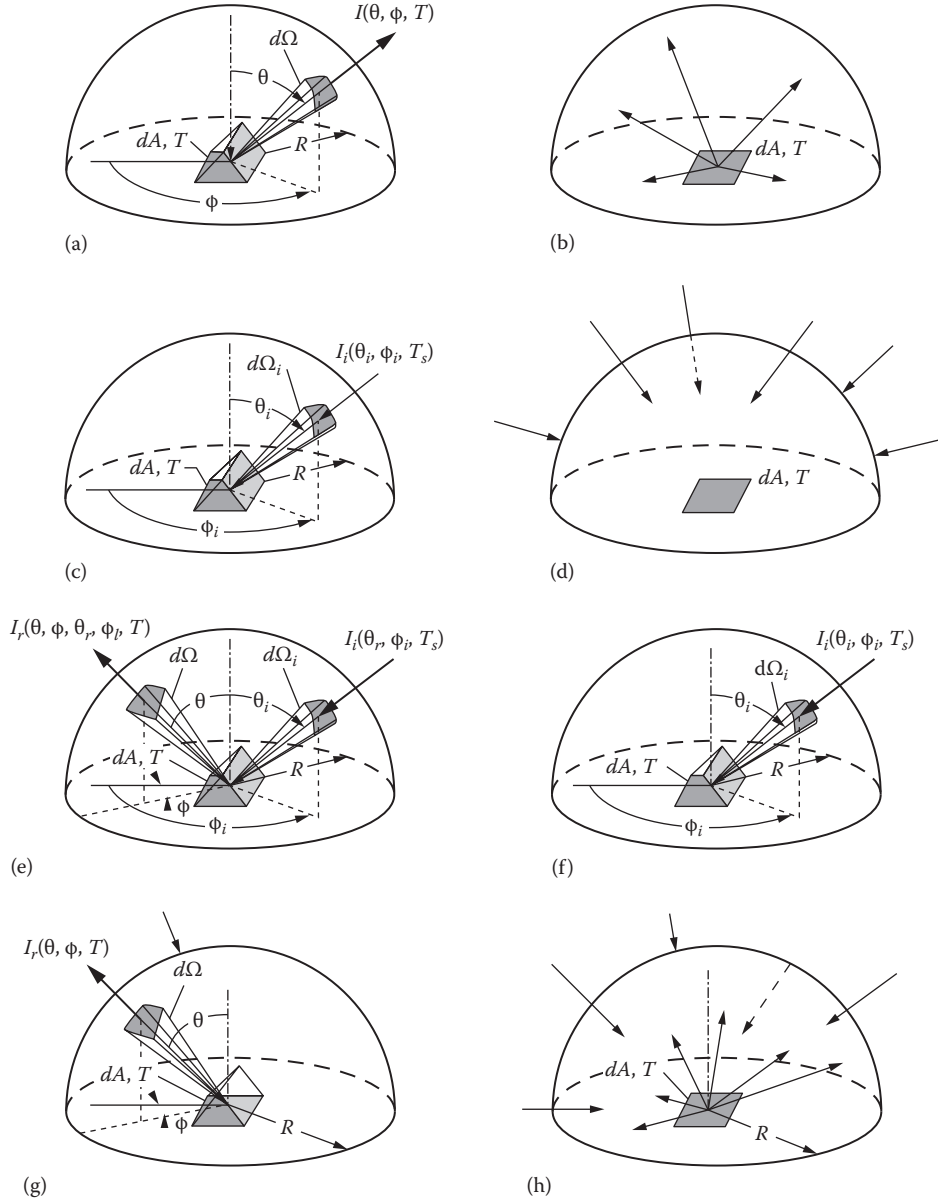


Figure 2.2 Pictorial descriptions of directional and hemispherical radiation properties. For spectral properties, the subscript λ is added the property definitions: (a) directional emissivity $\epsilon(\theta, \phi, T)$; (b) hemispherical emissivity $\epsilon(T)$; (c) directional absorptivity $\alpha(\theta, \phi, T)$; (d) hemispherical absorptivity $\alpha(T)$; (e) bi-directional reflectivity $\rho(\theta, \phi, \theta_i, \phi_i, T)$; (f) directional-hemispherical reflectivity $\rho(\theta, \phi, T)$; (g) hemispherical-directional reflectivity $\rho(\theta, \phi, T)$; (h) hemispherical reflectivity $\rho(T)$. *(Continued)*

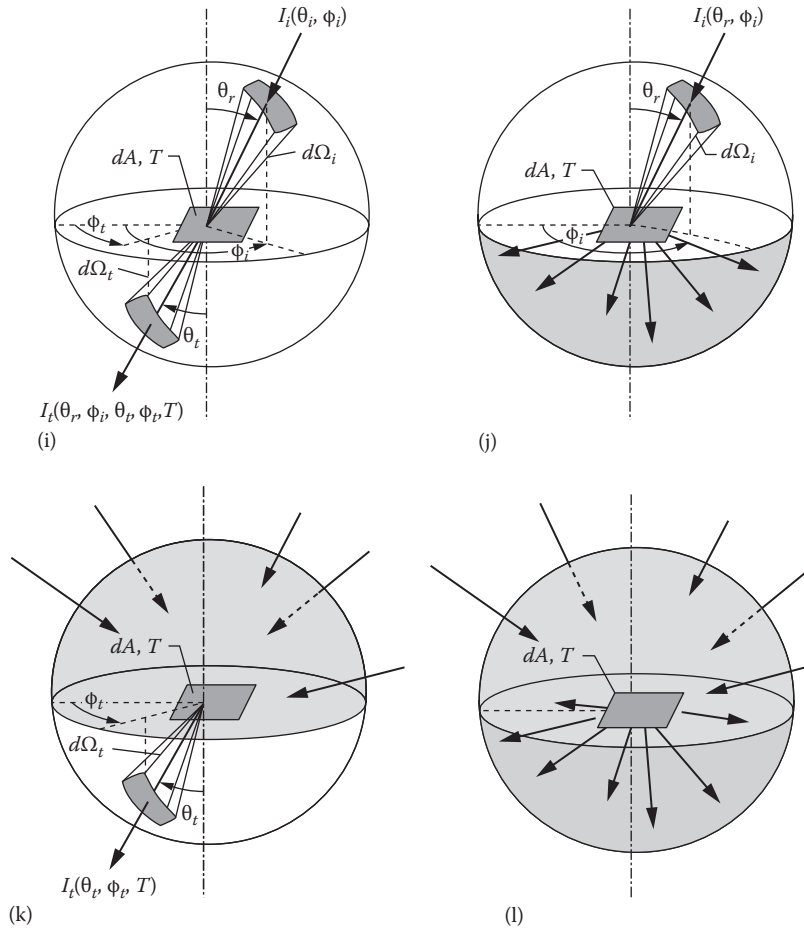


Figure 2.2 (Continued) Pictorial descriptions of directional and hemispherical radiation properties. For spectral properties, the subscript λ is added the property definitions: (i) bidirectional transmissivity $\tau(\theta_i, \phi_i, \theta_t, \phi_t, T)$; (j) directional-hemispherical transmissivity $\tau(\theta_i, \phi_i, T)$; (k) hemispherical-directional transmissivity $\tau(\theta_t, \phi_t, T)$; and (l) hemispherical transmissivity $\tau(T)$.

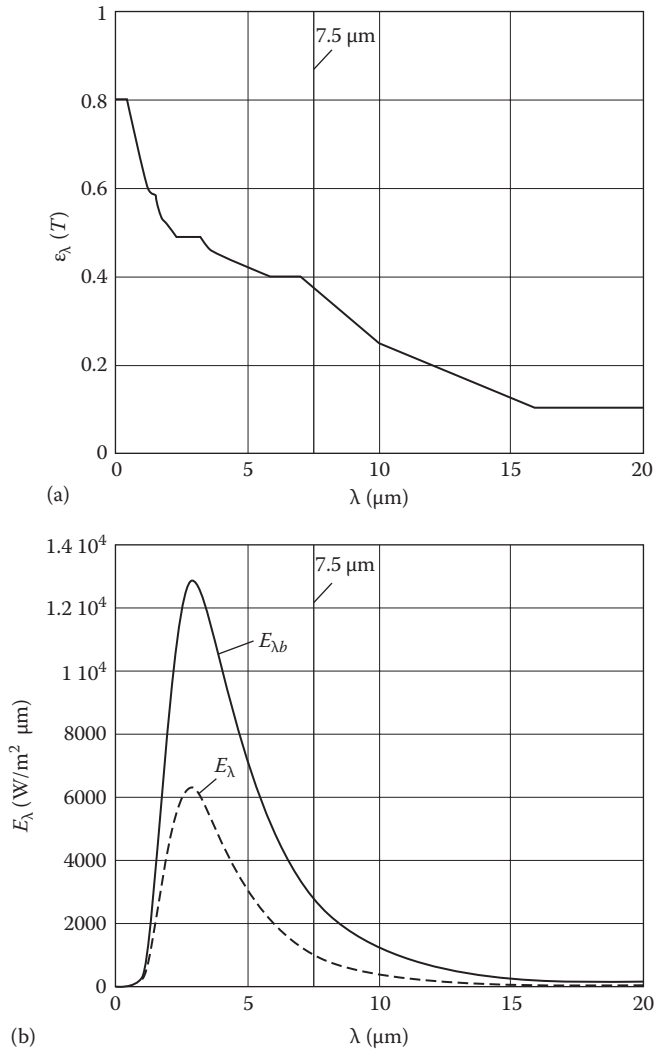


Figure 2.3 Physical interpretation of hemispherical spectral and total emissivities. (a) Measured emissivity values at $T = 1000\text{ K}$; (b) interpretation of emissivity as ratio of actual emissive power (dashed curve) to blackbody emissive power (solid curve).

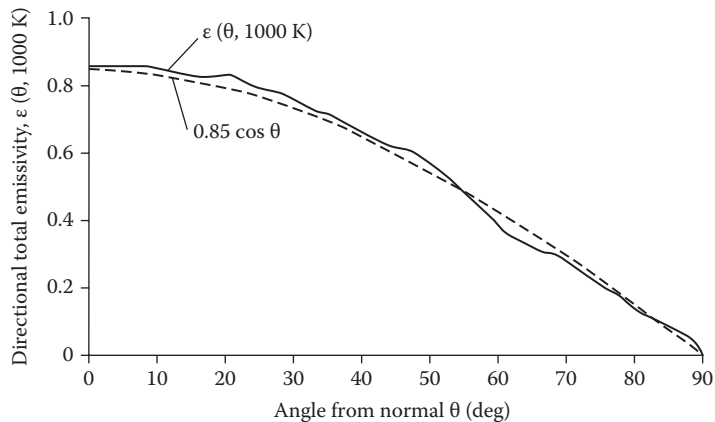


Figure 2.4 Directional total emissivity at 1000 K for Example 2.3.

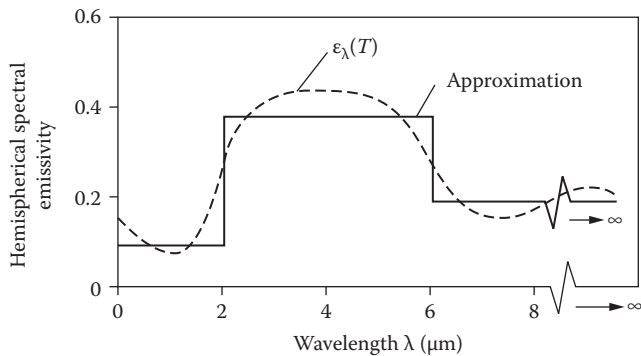


Figure 2.5 Hemispherical spectral emissivity for Example 2.4. Surface temperature $T = 1000$ K.

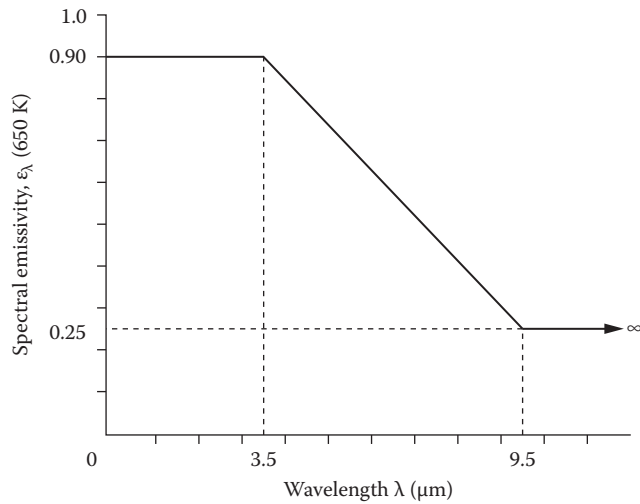


Figure 2.6 Spectral emissivity for Example 2.5.

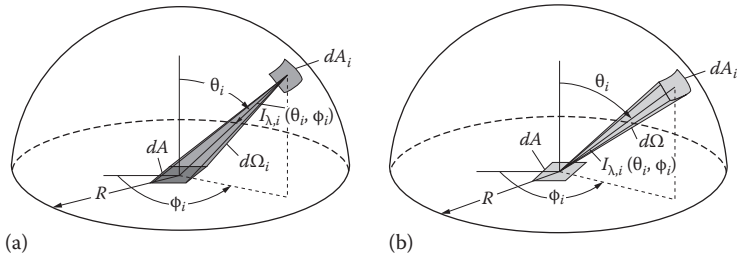


Figure 2.7 Equivalent ways of showing energy from dA_i that is incident upon dA . (a) Incidence within solid angle $d\Omega_i$ having origin at dA_i ; (b) incidence within solid angle $d\Omega$ having origin at dA .

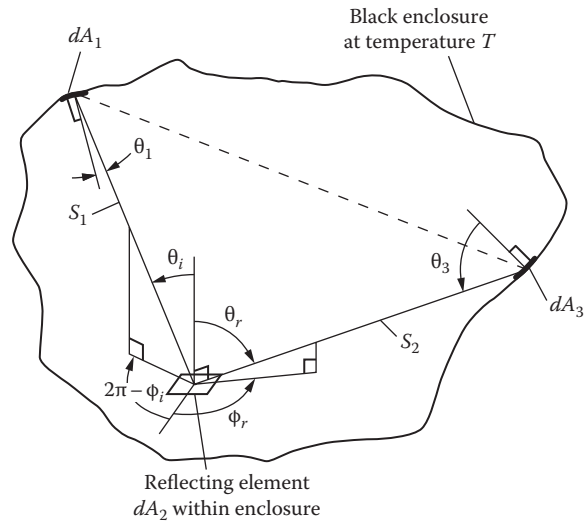


Figure 2.8 Enclosure used to examine reciprocity of bidirectional spectral reflectivity.

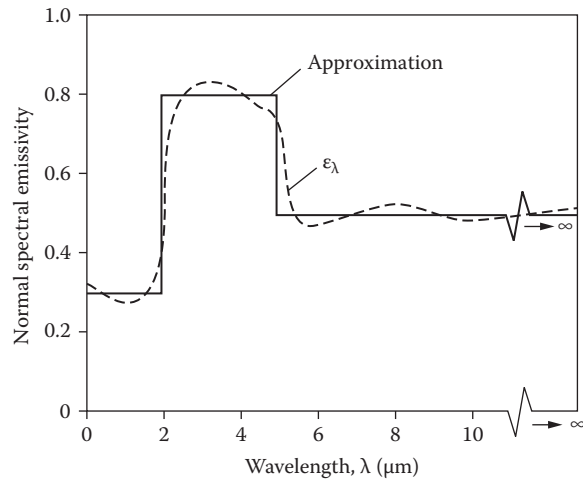


Figure 2.9 Directional spectral emissivity in normal direction for Example 2.9.