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Universal formulas for calculating emissivity and integral radiation flux densities of black bodies and subwavelength particles

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For the first time, universal formulas were obtained that are suitable for calculating the radiation coefficients and integral densities of radiation fluxes both for bodies having dimensions much larger than the wavelengths emitted by them ("large bodies") and subwave bodies (particles). The advantages of the proposed calculation method based on the theory of modes include: the exact relationship between the size, shape and temperature of bodies and the values of the radiation coefficients and integral densities of radiation fluxes; this method is much less labor intensive and more demonstrative than other methods.

Keywords: black body, Planck's law, Stefan-Boltzmann law, Wien displacement law, subwavelength particles, cut-off wavelength, diffraction, refraction, absorption, scattering, spatial mode, radiation flux density, radiation coefficient.

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