

1. Record Nr.	UNINA9910555041703321
Autore	Ledoux Michel
Titolo	Heat transfer 2 : radiative transfer // Michel Ledoux, Abdelkhalak El Hami
Pubbl/distr/stampa	London, England ; ; Hoboken, New Jersey : , : ISTE : , : Wiley, , [2021] ©2021
ISBN	1-5231-4351-7 1-119-82129-0 1-119-82130-4 1-119-82128-2
Descrizione fisica	1 online resource (261 pages)
Disciplina	621.4022
Soggetti	Heat - Transmission Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Half-Title Page -- Title Page -- Copyright Page -- Contents -- Preface -- Introduction -- 1.1. Preamble -- 1.2. Introduction -- 1.3. Interlude -- 1. General Remarks -- 1.1. Introduction -- 1.2. Propagation of a sinusoidal electromagnetic wave -- 1.2.1. Frequencies and wavelengths -- 1.2.2. Radiation spectrum -- 1.3. The concept of photometry -- 1.3.1. Geometric parameters -- 1.3.2. Radiance -- 1.3.3. Bouguer-Lambert law -- 1.3.4. Intensity -- 1.3.5. Lambert's law - a surface's emissivity -- 2. Calculating Luminances -- 2.1. Introduction -- 2.2. The black body: concept, luminance, Planck's law and approximations -- 2.2.1. Paradoxically, the black body is defined with reference to its absorption -- 2.2.2. Black body luminance -- 2.2.3. Emittance from the black body -- 2.2.4. Approximations of the luminance of the black body -- 2.2.5. Writing the luminance in terms of frequency -- 2.3. Stefan-Boltzmann law -- 2.3.1. Establishing the law -- 2.3.2. A direct application -- 2.4. Wien's laws -- 2.4.1. Wien's displacement law -- 2.4.2. Wien's second law -- 2.4.3. Greenhouse effect -- 2.5. Fraction of the total emittance of a black body radiated in a spectral band -- 2.5.1. An important tool: GOT functions -- 2.5.2.

An application -- 2.6. Emissivity of any body: a general case of a non-black body -- 2.6.1. Definition of monochromatic emissivity -- 2.6.2. Definition of global emissivity: a tricky concept -- 2.6.3. Emissivity of a gray body: a particular case -- 2.7. Simple applications -- 3. Emission and Absorption -- 3.1. Introduction -- 3.2. Absorption, reflection, transmission -- 3.3. Kirchhoff's law -- 3.4. Recap on the global absorption coefficient -- 3.4.1. General case -- 3.4.2. Case of the gray body -- 3.5. General case: multiple transfers -- 3.6. Absorption: the Beer-Lambert law -- 3.6.1. Radiation transfer -- 3.6.2. Beer's law.

4. Radiation Exchanges Between Surfaces -- 4.1. Introduction -- 4.2. Classification -- 4.3. The case of total influence -- 4.3.1. The case of two parallel plates. Lambert's law -- 4.3.2. Total influence between two black body surfaces, of temperatures T_w and T_a -- 4.3.3. Total influence between two surfaces -- 4.3.4. Total influence between two surfaces -- 4.3.5. Wall in total influence in an enclosure -- 4.3.6. Important note on the "thermal balance" -- 4.3.7. A practical approximation -- 4.3.8. Complex system of radiant finished surfaces: geometric form factor -- 4.3.9. Application -- 5. Analytic Applications -- 5.1. Introduction -- 5.2. Radiators, convectors and radiating fins -- 5.3. Radiation and oven -- 5.4. Radiation and metrology -- 5.4.1. Measuring a thermal conductivity -- 5.5. General problems -- 6. Modeling and Simulations under ANSYS -- 6.1. Conduction, convection and radiation -- 6.2. Conduction and convection using ANSYS software -- 6.2.1. Representation of the temperature field -- 6.3. Radiation using ANSYS software -- 6.4. Examples of modeling and analysis with ANSYS -- 6.4.1. Simple thermal conduction -- 6.4.2. Mixing conduction/convection/isolation -- 6.4.3. Transient thermal conduction -- 6.4.4. Study of thermal transfers from a brick wall and a cement wall (application to an oven) -- 6.4.5. Study of stationary thermal conduction in a reservoir intersected by a tube -- 6.4.6. Stationary thermal conduction on a cylinder -- 6.4.7. Cooling of a puck in transitory thermal -- 6.4.8. Study of a heat exchanger -- 6.5. Study of a thermal exchanger on ANSYS -- 6.5.1. Effectiveness of the PCM -- 6.5.2. Parameterizing the analysis -- 6.5.3. Thermal exchanger without an PCM -- 6.5.4. Thermal exchanger with hydrated salt -- 6.5.5. Thermal exchanger with paraffin -- 6.5.6. Influence of heat flux -- 6.5.7. Comparing PCM -- 6.6. Conclusion.

Appendix: GOT Function Table -- References -- Index -- Other titles from iSTE in Mechanical Engineering and Solid Mechanics -- EULA.
