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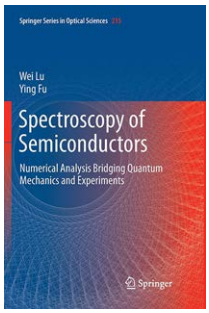

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Spectroscopy of Semiconductors
Numerical Analysis Bridging Quantum Mechanics and Experiments

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This is a very good undergraduate-level text presenting the basics of optical spectroscopy of solids and the most widely used spectroscopy techniques. In particular, the authors focus the book on semiconductors, trying to show how the macroscopic optical response of materials unravels the light-matter interaction at a microscopic level. Well suited for students in Physics, Chemistry, Materials Science and Engineering, the book is easy to read and gives the basic concepts and tools; as such, it can be a good reference for researchers as well.

In Chapter 1, the physical principles of the main optical elements and techniques used in spectroscopy are described. Prisms, diffraction gratings, Fourier transform instruments and modulation techniques are presented in a clear and concise way. A more advanced text may be necessary to complete the picture, with, *e.g.*, the physics of the most widely used detectors, elements for polarization-sensitive measurements, some insights onto time-resolved techniques.

Chapter 2 deals with the origin of the optical response of semiconductors, recalling some subjects of semiconductor physics. This is in my opinion out of focus, being it too long for a spectroscopy book, yet too short as a semiconductor physics text. Only Par. 2.3 is relevant and necessary to the book.

In Chapters 3 and 4 the principles of transmission and reflection properties and of photoluminescence are presented, with examples of application to semiconductors. Results on both bulk materials and nanostructures are discussed, giving a rather complete picture of optical spectroscopy applications.

Modulation spectroscopies are illustrated in Chapter 5, with theory and examples of various techniques, *i.e.* techniques based on different modulating stimuli. This is a rather unusual subject, yet very interesting, here well organized.

The last Chapters are less coherent with the rest of the book, but give the readers interesting examples of the wide use of spectroscopy. In Chapter 6, the response of semiconductors to light, as detected by electrical measurements, *i.e.* by collecting a photocurrent signal, is described in depth as a tool for the study of semiconductors. Finally Chapter 7 is devoted to colloidal quantum dots, *i.e.* rather specific systems interesting for nano-biophotonic.

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