

Linear and Nonlinear Optical Spectroscopy and Microscopy

The nonlinear optical spectrum signal technology is a new type of optical characterization technology owing to its non-invasiveness and good biocompatibility. This book highlights a comprehensive introduction to the Stimulated Raman scattering (SRS), Anti-Stokes Raman Spectroscopy (CARS), Two-photon Excited Fluorescence (TPEF) and Second Harmonic Generation signals (SHG) technologies. The four types of nonlinear optical signals technologies, especially two-dimensional and three-dimensional imaging, have great application potential in physics, materials science, chemistry and biomedicine. The book covers principles, theoretical calculation methods, signal measurement methods and imaging specific methods. The theoretical part starts from the basics of nonlinear optics and the relationship with strong light, and gradually transitions to theoretical calculation methods for specific optical signals. It combines the classical theory and the quantum theory to help readers develop a thorough understanding of the technologies. The book is a good reference for graduate students majored in physics and chemistry and for researchers working on optics, photonics and materials science.

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