

1. Record Nr.	UNINA9910458082603321
Autore	Jonasz Mirosław
Titolo	Light scattering by particles in water [[electronic resource] ] : theoretical and experimental foundations / / Mirosław Jonasz, Georges Fournier
Pubbl/distr/stampa	London, UK, : Academic Press, 2007
ISBN	1-281-11914-8 9786611119140 0-08-054867-9
Descrizione fisica	1 online resource (715 p.)
Altri autori (Persone)	FournierG (Georges)
Disciplina	535.43
Soggetti	Light - Scattering Water - Optical properties Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. [611]-681) and indexes.
Nota di contenuto	Cover; Table of Contents; Preface; Chapter 1 Basic principles of the interaction of light with matter; 1.1. Introduction; 1.2. The quantum field model; 1.3. Basic quantum electrodynamics; 1.4. Incoherent scattering; 1.5. Coherent scattering; 1.6. Basic scattering formalism; 1.7. The diffraction approximation; 1.8. Conclusion; 1.9. Problems; Chapter 2 Optical properties of pure water, seawater, and natural waters; 2.1. Introduction; 2.2. Physical properties and the intermolecular potential; 2.3. Radiative properties and the intramolecular potential; 2.4. The intrinsic scattering of pure water 2.5. Measurements of the absorption of pure water2.6. Analysis of the infrared and visible absorption spectrum; 2.7. Analysis of the UV absorption spectrum; 2.8. Organic substances dissolved in the water column: Gelbstoff; 2.9. An important special case: chlorophyll; 2.10. Problems; Chapter 3 General features of scattering of light by particles in water; 3.1. Introduction; 3.2. An inventory of solutions; 3.3. Basic structures in scattering; 3.4. Oceanic phase function approximations; 3.5. Basic experimental comparison; 3.6. Conclusions; 3.7. Problems Chapter 4 Measurements of light scattering by particles in water4.1. Introduction; 4.2. Scattering function; 4.3. Polarized light scattering:

the scattering matrix; 4.4. Light scattering data for natural waters; 4.5. Approximations of the volume scattering function; 4.6. Problems; Chapter 5 The particle size distribution; 5.1. Introduction; 5.2. The particle size definitions and the particle shape; 5.3. Definition and units; 5.4. An optimum particle size grid; 5.5. Transforming the size distribution; 5.6. Uncertainty of the PSD measurements; 5.7. Methods of PSD measurements  
5.8. Aquatic PSD data5.9. Problems; Chapter 6 Refractive indices and morphologies of aquatic particles; 6.1. The refractive index: introductory remarks; 6.2. Refractive index of water and seawater; 6.3. Refractive indices of particles; 6.4. Morphologies of aquatic particles; 6.5. Problems; Appendix; Bibliography; List of major symbols and abbreviations; Index

---

## Sommario/riassunto

Light scattering-based methods are used to characterize small particles suspended in water in a wide range of disciplines ranging from oceanography, through medicine, to industry. The scope and accuracy of these methods steadily increases with the progress in light scattering research. This book focuses on the theoretical and experimental foundations of the study and modeling of light scattering by particles in water and critically evaluates the key constraints of light scattering models. It begins with a brief review of the relevant theoretical fundamentals of the interaction of light with

---