

BOOK REVIEW

Ishimaru, Akira, *Wave Propagation and Scattering in Random Media*, Volume 1. Academic Press, New York, 1978, \$22.50.

This work, which will consist of two volumes, is intended for scientists and engineers interested in optical, acoustic, and microwave propagation and scattering in media varying randomly in space and time or—practically speaking—nearly all atmospheres, biological specimens, and oceans. The first volume deals with single scattering and transport (radiative transfer) theory, the second volume with multiple scattering, random continua, rough surfaces, and inversion techniques. This review is for Volume 1 only.

Professor Ishimaru has produced an excellent collection of topics, historically treated separately, with consistent notation and at a level easily grasped by nonspecialists in this field. He has avoided the mathematical complexity of some authors, while successfully conveying fundamental concepts in radiative transfer and scattering theory. If more detail is desired, a comprehensive bibliography is provided. Also, the book gives quantitative examples of the application of theory to real-world problems, as well as numerical characteristics of discrete scatterers in various media.

Specific topics treated include particulate scattering and absorption, both exact and approximate, temporal and spatial properties of waves propagating in tenuous random media, coherence, bistatic and monostatic remote sensors, and CW and pulse properties of waves. In transport theory, various solutions of the plane-parallel problems are treated for finite and infinite beams and for point sources. Approximations, such as two- and four-flux theory, Gauss quadrature, and small angle are considered. Isotropic scattering and semiinfinite and layered media are treated. Throughout, insight is given to computer implementation and application to real problems.

Overall, Volume 1 fulfills a need for those interested in classical and statistical propagation theory, as applied to atmospheric, oceanographic, biological, and acoustic problems in communication and remote sensing. It accomplishes this by presenting heretofore dispersed material in a concise but not overly detailed manner, with consistent notation, and with illuminating practical examples.

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