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Book Review: *Principles of Statistical Radiophysics, 4, Elements of Random Fields*

Principles of Statistical Radiophysics, 4, Elements of Random Fields, S. M . Rytov, Y. A. Kravtsov, and V. I. Tatarski, Springer-Verlag, Berlin, 1989.

This book is the fourth in a series on statistical radiophysics. Like Volume 3, this volume may also be read almost independently of the other volumes, but the reader is required to have a good background in statistical concepts as applied to random fields. There are many useful exercises in the book and it may be used as a text for second- or third-year graduate students.

The book is composed of five chapters. The first four treat volume scattering in random media. The first chapter discusses the method of geometric optics, the second the method of smooth perturbations, the third the Markov approximation, and the fourth treats multiple scattering. The fifth chapter discusses some elements of rough surface scattering. As in the previous books, the presentation is thorough and very careful attention is paid to all approximations that are made.

To an active researcher in the field this is a very disappointing book. The original Russian version appeared in 1978, but there is a forward written in 1986 and a preface written in 1989. The book almost completely ignores work in the West (for example, the important papers showing the severe limitations of the method of smoothing for multiple scattering problems) and does not even parenthetically mention the new work in the early 1980s that allow us to solve the fourth-order moment equations for the scintillation index and correlation of intensities. Most of the significant developments made prior to 1978 that are discussed in the book already appear in Tatarski's book, *The Effects of the Turbulent Atmosphere on Wave Propagation*, written in 1971.

For graduate students and researchers entering the field of wave propagation in random media I would certainly recommend this book, since it provides an excellent introduction to the basic ideas and equations

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that are currently accepted by people in the field. On the other hand, this book is not suitable for workers in the field who want to learn of developments after 1978.

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