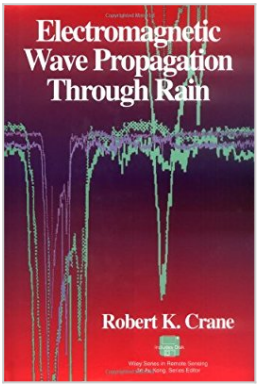

Electromagnetic Wave Propagation Through Rain

By Robert K. Crane

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Climatic factors such as rain, snow, and other forms of precipitation can have a significant impact on the transmission of radio, light, or heat waves in the atmosphere. Communication systems may experience a loss of signal caused by the effects of rain on a radio link. Radar systems may experience interference that distorts the amplitude of the target signal. Any remote sensing system that relies on the propagation of electromagnetic waves must therefore be designed to take these factors into account.

Electromagnetic Wave Propagation Through Rain was written to help system designers in such fields as meteorology, telecommunications, radar, and aircraft guidance systems face the challenge of predicting and compensating for these potentially serious weather-related effects on communication or remote sensing systems around the world and above the surface of the earth.

Electromagnetic Wave Propagation Through Rain describes and analyzes the interaction between electromagnetic waves and various forms of precipitation. Interdisciplinary in approach, this book provides a solid in-depth treatment of the underlying physics as well as applications in communications, the aerospace industry, and meteorology.

Through a combination of observations and models, Dr. Crane provides both students and practitioners of communication system design with a reliable statistical base for determining the frequency and severity of precipitation-generated attenuation episodes that can significantly impact on vital electromagnetic waves in the atmosphere.

An invaluable book for professionals and advanced students in electrical, aerospace, and communications engineering, remote sensing, physics, and meteorology, Electromagnetic Wave Propagation Through Rain represents a significant addition to the literature and an important contribution to our understanding and management of this problem.

Precipitation patterns can have a major impact on telecommunication and radar systems around the world. The frequency and duration of rain or snow in any

given area at any given time can determine the extent to which vital electromagnetic waves may be compromised--causing interference or even failure in a system. The result of more than 30 years of research, Electromagnetic Wave Propagation Through Rain provides a clear analysis of attenuation by rain and other forms of precipitation on a wide range of vital communication systems.

Using observations and models, the author offers predictable statistics of rain events which can help to achieve more effective system designs. Its practical interdisciplinary approach makes Electromagnetic Wave Propagation Through Rain an indispensable resource for engineering professionals and advanced students in electrical, aerospace, and communications engineering.

Major topics covered include:
* Effects of Rain
* Rain Structure and Rain-Rate Statistics
* Rain-Rate Climate Models
* Modeling Attenuation by Rain
* Attenuation Mitigation via Diversity
* Worst-Month Statistics
* Estimating Risk

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Editorial Review

Review
"Robert Crane has written a highly technical and useful manual that those in communications engineering will find useful." (*E-Streams*, Vol. 7, No. 5)

From the Publisher
An in-depth examination of the interaction between electromagnetic waves, such as radio, light, and heat waves, with precipitation, an area of concern to engineers working in meteorology, telecommunications, aerospace systems, and other fields. Offers a detailed discussion of underlying physics as well as practical applications. Focuses on the effects of rain, the measurement of those effects and on ways to build better models for the prediction of effects on new systems, systems to be deployed in regions lacking measurements, or on systems having unique propagation geometries.

From the Back Cover
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