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Nota di contenuto	Radio Wave Propagation in the Marine Boundary Layer; Preface; Contents; 1 Atmospheric Boundary Layer and Basics of the Propagation Mechanisms; 1.1 Standard Model of the Troposphere; 1.2 Non-standard Mechanisms of Propagation; 1.2.1 Evaporation Duct; 1.2.2 Elevated M-inversion; 1.3 Random Component of Dielectric Permittivity; 1.3.1 Locally Uniform Fluctuations; References; 2 Parabolic Approximation to the Wave Equation; 2.1 Analytical Methods in the Problems of Wave Propagation in a Stratified and Random Medium 2.2 Parabolic Approximation to a Wave Equation in a Stratified Troposphere Filled with Turbulent Fluctuations of the Refractive Index2. 3 Green Function for a Parabolic Equation in a Stratified Medium; 2.4 Feynman Path Integrals in the Problems of Wave Propagation in Random Media; 2.5 Numerical Methods of Parabolic Equations; 2.6 Basics of Focks Theory; 2.7 Focks Theory of the Evaporation Duct; References; 3 Wave Field Fluctuations in Random Media over a Boundary Interface; 3.1 Reflection Formulas for the Wave Field in a Random Medium over an Ideally Reflective Boundary

3.1.1 Ideally Reflective Flat Surface 3.1.2 Spherical Surface; 3.2 Fluctuations of the Waves in a Random Non-uniform Medium above a Plane with Impedance Boundary Conditions; 3.3 Comments on Calculation of the LOS Field in the General Situation; References; 4 UHF Propagation in an Evaporation Duct; 4.1 Some Results of Propagation Measurements and Comparison with Theory; 4.2 Perturbation Theory for the Spectrum of Normal Waves in a Stratified Troposphere; 4.2.1 Problem Formulation; 4.2.2 Linear Distortion; 4.2.3 Smooth Distortion; 4.2.4 Height Function 4.2.5 Linear-Logarithmic Profile at Heights Close to the Sea Surface 4.3 Spectrum of Normal Waves in an Evaporation Duct; 4.4 Coherence Function in a Random and Non-uniform Atmosphere; 4.4.1 Approximate Extraction of the Eigenwave of the Discrete Spectrum in the Presence of an Evaporation Duct; 4.4.2 Equations for the Coherence Function; 4.5 Excitation of Waves in a Continuous Spectrum in a Statistically Inhomogeneous Evaporation Duct; 4.6 Evaporation Duct with Two Trapped Modes; References; 5 Impact of Elevated M-inversions on the UHF/EHF Field Propagation beyond the Horizon 5.1 Modal Representation of the Wave Field for the Case of Elevated M-inversion 5.2 Hybrid Representation; 5.2.1 Secondary Excitation of the Evaporation Duct by the Waves Reflected from an Elevated Refractive Layer; 5.3 Comparison of Experiment with the Deterministic Theory of the Elevated Duct Propagation; 5.4 Excitation of the Elevated Duct due to Scattering on the Fluctuations in the Refractive Index; References; 6 Scattering Mechanism of Over-horizon UHF Propagation; 6.1 Basic Equations; 6.2 Perturbation Theory: Calculation of Field Moments 6.3 Scattering of a Diffracted Field on the Turbulent Fluctuations in the Refractive Index

Sommario/riassunto

Based on his many years of professional experience at leading companies in communications technology, the author describes an analytical solution for wave propagation over the sea surface in an atmospheric boundary layer. His approach allows the detailed analysis of combined effects of diffraction, refraction and scattering in random media. While specific applications covered are targeted at radio wave propagation over the sea surface, a similar approach is applicable to many problems in underwater acoustics, seismology, solid matter physics and astrophysics.
