



Application of an Extended Parabolic Equation to the Calculation of the Mean Field and the Transverse and Longitudinal Mutual Coherence Functions Within Atmospheric Turbulence (Paperback)

By National Aeronautics and Space Adm Nasa

Independently Published, United States, 2018. Paperback. Condition: New. Language: English. Brand new Book. Solutions are derived for the generalized mutual coherence function (MCF), i.e., the second order moment, of a random wave field propagating through a random medium within the context of the extended parabolic equation. Here, "generalized" connotes the consideration of both the transverse as well as the longitudinal second order moments (with respect to the direction of propagation). Such solutions will afford a comparison between the results of the parabolic equation within the paraxial approximation and those of the wide-angle extended theory. To this end, a statistical operator method is developed which gives a general equation for an arbitrary spatial statistical moment of the wave field. The generality of the operator method allows one to obtain an expression for the second order field moment in the direction longitudinal to the direction of propagation. Analytical solutions to these equations are derived for the Kolmogorov and Tatarskii spectra of atmospheric permittivity fluctuations within the Markov approximation. Manning, Robert M. Glenn Research Center NASA/TM-2005-213841, E-15211.



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