

Preface

Radar cross section (RCS) studies depends on various factors such as the frequency, electrical size of target, polarization, orientation of target, material, etc. For a phased array, the RCS estimation is a complicated procedure. It has to take into account not only individual antenna element but also their geometrical configuration, its feed network, mutual coupling between the antenna elements, etc. This book presents the formulation for the RCS of parallel-fed linear dipole array in the presence of mutual coupling. The RCS estimation is done based on the signal path within the antenna system. The scattered field is expressed in terms of array design parameters including the reflection and transmission coefficients. The presence of coupling between the array elements is considered. The scattering due to the impedance mismatches up to second level of couplers is taken into account. The effect of finite dipole-length, inter-element spacing, scan angle, array configuration, amplitude distribution, and terminating load impedance on the RCS pattern is studied. The scattering cross section of a phased array may be controlled by choosing optimum design parameters. The formulation discussed in this book may be further adapted for any arbitrary antenna element and geometrical configuration.

Hema Singh
H.L. Sneha
Rakesh Mohan Jha

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Singh, H.; Sneha, H.L.; Jha, R.M.

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