

Preface

The sensors mounted over an aerospace platform contribute significantly to the radar cross section (RCS) of the structure. The estimation of scattering in phased arrays involves complicated computations. It is not only antenna elements of phased array that give rise to scattering of impinging signal, but also the various components such as phase shifters, couplers, terminating impedances of feed network also contribute to scattered field. The signal path needs to be traced as it travels from the array aperture to subsequent component levels of feed network before reaching the receive port.

In this book, scattering of parallel-fed planar dipole arrays is presented in terms of reflection and transmission coefficients at various level of the array system. The signal undergoes reflection and transmission at various levels of feed network due to impedance mismatches. These levels include antenna aperture, phase shifters, first and second level of couplers and terminating impedance. The scattering behavior of the array depends on the design parameters, viz., antenna elements, geometric configuration, inter-element spacing, and impedances of each component of feed network. The planar dipole array is considered as stacked linear array along the y-direction. The mutual coupling effect is included in the RCS formulation. The detailed analytical description of radar cross section of planar dipole array provides a clear picture of the scattering phenomena that takes place in the phased arrays.

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