

Monostatic RCS Computation of Reflector Antennas Using Parabolic Equation

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Abstract

The parabolic equation method gives accurate results in calculation of scattering from objects with dimensions ranging from one to tens of wavelengths. Solving parabolic equation with the marching method needs limited computer storage even for scattering calculations of large targets. In order to compute monostatic RCS, backward scattered field is required. Parabolic equation separates forward and backward scattered fields. In this paper, first the calculation procedure of monostatic radar cross section using parabolic equation in three dimension is studied and the necessary equations are derived. Backward scattered fields in three dimension are calculated by developing two dimensional method. Monostatic RCS of a reflector antenna has been computed by using a staircase model in the parabolic equation. The results are compared with physical optics results.