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ACCURACY REQUIREMENT ANALYSIS OF FEED EXCITATION COEFFICIENTS OF
MULTIPLE-BEAM REFLECTOR ANTENNAS

Abstract

Multiple-beam reflector antennas are new generation satellite antennas. There are several antenna designs that suitable for multiple-beam reflector antennas, where the single-aperture design with feed array is often used. This antenna design forms composite beams through adding up element beams multiplied by the feed excitation coefficients. The composite beam patterns are determined by the feed excitation coefficients, and the accuracy of feed excitation coefficients affects that of the composite beam patterns. In this paper, the relationship between the accuracy of feed excitation coefficients and that of the composite beam patterns is analyzed through simulating a single-aperture multiple-beam reflector antenna, and the corresponding curves are presented. The analysis results are useful for accuracy design of the phase-shifters and the attenuators, which are used for realizing the feed excitation coefficients, in design of the multiple-beam reflector antennas.