Probe-corrected spherical near-field antenna measurements

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pi and beta_c = beta0c. Since the four angles, phi, phi', beta_c, and beta0c are mutually independent, the argument of F in (1) may take any value between 0 and pi and, accordingly, F may take any value between 0 and 1, depending on the way the diffracted ray approaches the direction of reflection (incidence). As a result, the calculated corner diffracted field is nonunique for these directions and its behavior in the adjacent transition regions is far from being the true physical behavior. In particular, this should lead to incorrect results for the backscatter from flat plates in the directions close to normal. Indeed, according to (7), the corner diffraction coefficient for nearly normal backscattering is dominated by the term

\[ D^c_{rh} \sim \frac{j \tan \beta_c}{8\pi \cos \phi} \left( \frac{\cos^2 \phi/\lambda}{k \cos^2 \beta_c} \right), \tag{2} \]

which diverges as phi \to \pi/2, beta_c \to \pi/2. Although the singularities in the corner diffracted fields emanating from the corners of a given polygonal plate can be shown to cancel one another, the resulting total backscattered field depends on the limiting values of F in (2) for the different edges of the plate. Since the latter are nonunique, so is the value of the backscattered field.

Dissertation Abstract

Probe-Corrected Spherical Near-Field Antenna Measurements

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REFERENCES