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Correction Model for Reflection off Rough Conductive Surfaces[1]
W. TODD DOUGHTY, R. STEVEN TURLEY, Brigham Young University, ELISE MARTIN, JED JOHNSON — We modeled the reflectance from rough surfaces of conductors for both TM and TE polarization. We used a Nystrom technique to solve the Electric Field Integral Equation in the TM case and the Magnetic Field Integral Equation in the TE case. We studied a large number of sample surfaces with varied roughness heights and frequencies from various incident angles and compared these results to the expected results from Debye-Waller. We determined that the Roughness correction is a function of qh, as is proposed by Debye Waller, where q is $2\pi \sin\theta/\lambda$ and h is the rms surface roughness height. In addition to the quadratic term predicted, our simulations showed significant linear and cubic terms. These terms are especially significant for high spatial frequency roughness where the spatial frequency is on the order of a wavelength.

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