Modification of Classical SPM for Slightly Rough Surface Scattering with Low Grazing Angle Incidence

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Abstract: Based on the impedance/admittance rough boundaries, the reflection coefficients and the scattering cross section with low grazing angle incidence are obtained for both VV and HH polarizations. The error of the classical perturbation method at grazing angle is overcome for the vertical polarization at a rough Neumann boundary of infinite extent. The derivation of the formulae and the numerical results show that the backscattering cross section depends on the grazing angle to the fourth power for both Neumann and Dirichlet boundary conditions with low grazing angle incidence. Our results can reduce to that of the classical small perturbation method by neglecting the Neumann and Dirichlet boundary conditions.

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