Abstracts

Accuracy of the method of moments for scattering by a cylinder

K.E. Warnick and Weng Cho Chew. "Accuracy of the method of moments for scattering by a cylinder." 2000 Transactions on Microwave Theory and Techniques 48.10 (Oct. 2000 [T-MTT]): 1652-1660.

We study the accuracy and convergence of the method of moments for numerical scattering computations for an important benchmark geometry: the finite circular cylinder. From the spectral decomposition of the electric-field integral equation for this scatterer, we determine the condition number of the moment matrix and the dependence of solution error on the choice of basis functions, discretization density, polarization of the incident field, and the numerical quadrature rule used to evaluate moment-matrix elements. The analysis is carried out for both the TM polarization (weakly singular kernel) and TE polarization (hypersingular kernel). These results provide insights into empirical observations of the convergence behavior of numerical methods in computational electromagnetics.

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