

# Boundary integral methods for periodic scattering problems

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The talk is devoted to the scattering of a plane wave obliquely illuminating a periodic surface. Integral equation methods lead to a system of singular integral equations over the profile. Using boundary integral techniques we study the equivalence of these equations to the electromagnetic formulation, the existence and uniqueness of solutions under general assumptions on the permittivity and permeability of the materials. In particular, new results for materials with negative permittivity or permeability are established.