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Stephen Shipman* (shipman@math.lsu.edu), **Oscar Bruno**, **Catalin Turc** and **Stephanos Venakides**. *Evaluation of 2D-periodic 3D EM scattering at Wood-anomaly frequencies.*

Computation of EM scattering by a doubly periodic grating near cutoff, or Wood, frequencies is notoriously difficult because of the divergence of the Green function. This is due to one of the Fourier modes striking the grating at grazing incidence. To compute scattering in this regime, we modify the Green function by adding two types of terms to it. The first type adds weighted spatial shifts of the Green function to itself with singularities below the grating; this yields algebraic convergence. The second-type terms are quasi-periodic plane wave solutions of the Helmholtz equation. They reinstate (with controlled coefficients) the grazing modes, effectively eliminated by the terms of first type. These modes are needed in the Green function for guaranteeing the well-posedness of the boundary-integral equation for the scattered field. (Received August 20, 2013)