

Time and frequency domain modelling of a normally incident plane wave at a periodic structure

Y. Cai and C Mias, School of Engineering, Warwick University, Coventry, UK. CV4 7AL
yong.cai@warwick.ac.uk and c.mias@warwick.ac.uk

Abstract

A two-dimensional singly periodic structure is modelled using the finite-element time-domain (FETD) method. A normally incident plane wave of transverse magnetic polarization is assumed. For the first time, an accurate Floquet harmonic absorbing boundary condition is employed over the non-periodic boundaries of the computational domain. The FETD results are shown to be in excellent agreement with those of the finite element frequency domain method and the independently published literature. Results are shown for the cases of a dielectric slab grating and an infinitely thin metallic grating.