1023-78-1279 **David P. Nicholls*** (nicholls@math.uic.edu), Department of Math, Stat., and Comp. Sci., 851 South Morgan Street (MC 249), Chicago, IL , and **Fernando Reitich**, School of Mathematics, 127 Vincent Hall, 206 Church St., S. E., Minneapolis, MN 55455. *Boundary Perturbation Methods for High-Frequency Scattering.*

In this talk we will take up the problem of producing reliable numerical simulations of high-frequency scattering (acoustic or electromagnetic) returns from diffraction gratings in two and three dimensions. We will present an extension of the classical Boundary Perturbation techniques of Rayleigh and Rice, which were extended to high order by Bruno and Reitich. This extension is specially designed for high-frequency simulations and we will display, with several numerical examples, the efficient and accurate nature of the method within its domain of applicability. (Received September 27, 2006)