1015-78-207 **S. Moskow*** (moskow@math.ufl.edu), Department of Mathematics, University of Florida, Gainesville, FL 32611, and **F. Santosa** and **J. Zhang**. *An approximate method for scattering by thin structures.*

Scattering of waves by a thin structure is considered in this work. The Helmholtz equation with variable coefficient models the wave phenomena. The scatterer is assumed to have a high (possibly periodic) index of refraction while at the same time it is very small in one of the dimensions. We show that if the index scales as $O(1/h)$, where h is the thickness of the scatterer, then an approximate solution, based on perturbation analysis can be obtained. The approximate solution consists of a leading order term plus a corrector, each of which solves an integral equation in two dimensions for a three-dimensional problem. We provide error analysis on the approximation. The approximate method can be viewed as an efficient computational approach since it can potentially greatly simplify scattering calculations. Applications in mind are for the modeling and design of photonic band gap materials. (Received February 06, 2006)