1075-65-247 **Jie Shen*** (shen7@purdue.edu), Department of Mathematics, Purdue University, West Lafayette, IN 47906. *Efficient and Stable Spectral Methods for Scoustic and Electromagnetic scattering.*

I shall present an efficient and stable spectral algorithm and their numerical analysis for the Helmholtz and Maxwell equations in both two- and three-dimensional in exterior domains or in periodic layered media. The algorithm couples a boundary perturbation technique with a well-conditioned spectral-Galerkin solver based on the Dirichlet-to-Neumann operator. Error analysis with explicit dependence on the wave number as well as ample numerical results will be presented to show the accuracy, stability, and versatility of this algorithm. (Received August 31, 2011)