Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

**Robust Optimization of Aperiodic Photonic Structures**[1] OMID NOHADANI, KWONG MENG TEO, DIMITRIS BERTSIMAS, Massachusetts Institute of Technology — In engineering design, the physical properties of a system can often only be described by numerical simulation. Optimization of such systems is usually accomplished heuristically without taking into account that there are implementation errors that lead to very suboptimal, and often, infeasible solutions. We present a novel robust optimization method for electromagnetic scattering problems with large degrees of freedom, and report on results when this technique is applied to optimization of aperiodic dielectric structures. The spatial configuration of 50 dielectric scattering cylinders is optimized to match a desired target function such that the optimal arrangement is robust against placement and prototype errors. Our optimization method inherently improves the robustness of the optimized solution with respect to relevant errors and is suitable for real-world design of materials with novel electromagnetic functionalities.

[1]supported by DARPA.

Omid Nohadani
Massachusetts Institute of Technology

Date submitted: 16 Nov 2006 Electronic form version 1.4