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**Robert P Viator Jr\*** (rviato2@lsu.edu) and **Robert Lipton**. *Asymptotic Analysis of High-Contrast Photonic Crystals*. Preliminary report.

We consider quasi-periodic transverse-electric modes traveling through a photonic crystal. The crystal is a periodic array of unit cells  $Y$  consisting of two phases (the *inclusion*  $D \Subset Y$  and the *host*  $Y \setminus D$ ) made of isotropic materials, where the electric permittivity  $\varepsilon_D = d$  in  $D$  is much higher than the permittivity in the host  $Y \setminus D$ . We calculate a power series expansion for the frequency  $\omega^2$  in terms of  $d$  and show a lower bound for its radius of convergence using spectral techniques arising from layer potentials and perturbation analysis. (Received September 16, 2014)