

1116-VC-2392      **Robert Lipton** and **Robert P Viator\*** (rviato2@lsu.edu), 9989 Burbank Dr, Apt 60, Baton Rouge, LA 70810. *Radii of Convergence for Power Series Expansions of Eigenfrequencies of High-Contrast Photonic Crystals.*

We consider periodic and quasi-periodic transverse electric modes traveling through a high-contrast photonic crystal. The crystal is a 2-dimensional periodic array of unit cells  $Y$  consisting of a high-contrast inclusion phase  $D \Subset Y$  and a host phase  $Y \setminus D$  made of isotropic materials. A power series expansion in the high-contrast limit  $\varepsilon_{Y \setminus D}^{-1} = k^{-1} \rightarrow 0$  of the eigenfrequencies for this material is calculated, along with an explicit lower bound on the radius of convergence in terms of the quasi-momentum, the Dirichlet spectrum of  $D$ , and the spectrum of a related eigenvalue problem associated with a Neumann-Poincaré operator on  $\partial D$ . (Received September 22, 2015)