1086-35-2086   **Yue Chen** and **Robert Lipton*** (`lipton@math.lsu.edu`). *Dispersion relations for double negative metamaterials.*

Metamaterials with frequency dependent double negative effective properties are constructed from sub-wavelength periodic arrays of coated inclusions. Power series are developed for the dispersion relation and the associated Bloch wave solutions. The expansion parameter is the ratio of the length scale of the periodic lattice to the wavelength. Numerical simulations show that the leading order term in the power series for the dispersion relation is a good predictor of the dispersive behavior of the metamaterial. (Received September 24, 2012)