Abstract Submitted
for the NEF10 Meeting of
The American Physical Society

Photoacoustic effect in a periodically modulated structure[1] BINBIN WU, GERALD DIEBOLD, Brown University — We discuss the photoacoustic effect in one-dimensional phononic structures with sinusoidal modulation of its acoustic properties. The periodic structure is considered to have a modulation in its density or compressibility of the form $1 - 2\gamma\cos(\frac{2\pi x}{a})$, where γ is the modulation factor and a is the periodic length of the phononic structures. The properties of the photoacoustic waves are determined by an inhomogeneous Mathieu equation. We give several different methods including Green's function solutions, series expansions, and variation of parameters solutions for determining closed from solutions to the inhomogeneous Mathieu equation to obtain the properties of the photoacoustic effect.

[1]The authors are grateful for the support of this research by the US Department of Energy under Grant ER13235.

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Date submitted: 30 Sep 2010 Electronic form version 1.4