Photoacoustic effect in a periodically modulated structure BIN-
BIN WU, GERALD DIEBOLD, Brown University — We discuss the photoacous-
tic 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 expan-
sions, and variation of parameters solutions for determining closed from solutions to
the inhomogeneous Mathieu equation to obtain the properties of the photoacoustic
effect.

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