

Abstract Submitted  
for the APR18 Meeting of  
The American Physical Society

**Controlling electromagnetic waves in a class of invisible materials**<sup>1</sup> YANGJIE LIU, Hubei University — We propose a general methodology to manipulate the amplitude of an electromagnetic wave in a pre-defined way, without introducing any scattering. This leads to a whole class of isotropic spatially varying permittivity and permeability profiles that are invisible to incident waves. The theory is illustrated through various numerical examples, including the non-magnetic case. The implementation of the required material properties using metamaterials is discussed, as well as extensions of the method for controlling the phase of electromagnetic fields. Transformation optics is a powerful analytic tool to design impedance-matched material, which gives rise to scattering-free wave solutions up to designers will. However, this method inevitably requires the material parameter to be anisotropic, which complicates its manufacturing process. Therefore, an isotropic material to achieve the required wave solution may solve this issue. Here in this conference contribution, we try to reveal one method to serve the purpose to cater for designers requirements for electromagnetic waves.

<sup>1</sup>Antennas group travel grant [EECSRC2/4a] from Queen Mary

Yangjie Liu  
Queen Mary Univ London

Date submitted: 19 Jan 2018

Electronic form version 1.4