



Seismic metamaterials an overview

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In recent years it has been realised that the ideas behind metamaterials, originally developed for electromagnetic wave systems, are relevant to a much broader class of wave systems. Here we describe three current designs for cloaking, shielding and wave redirection for elastic waves that have their origins in subwavelength resonance, transformation optics and phononic crystal design. Experiments, both at the laboratory and fieldscale will be described and how those results align with the theoretical predictions.

I will also summarise mathematical and numerical developments that have aided in the understanding and design of metamaterial devices that may be of broad interest. In particular this will involve homogenisation methods valid at frequencies away from the conventional long-wave limitation.