Society of Engineering Science 51st Annual Technical Meeting

1–3 October 2014

Purdue University, West Lafayette, Indiana, USA

Programmable mechanical metamaterials: BiHolar networks

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ABSTRACT

We probe the mechanics of BiHolar metamaterials, 2D elastic media with a square lattice of circular holes of two different sizes. Biaxial loading of these BiHolar structures leads to a wealth of mechanical responses, including mechanically switchable hysteresis and memory effects. We show that we can program the mechanical response with the loading force and the hole size ratios.