

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Soft color-composites for optical switching and dimming FRANCISCO LOPEZ JIMENEZ, Massachusetts Inst of Tech-MIT , PRIYANK UPADHYAYA, JOHANNES LILJENHJERTE, KUMAR SHANMUGAM, Masdar Institute of Science and Technology, PEDRO REIS, Massachusetts Inst of Tech-MIT — We present a novel class of soft and actuable color-composites, whose optical transmittance can be switched and tuned by mechanical deformation, on demand. Our samples are fabricated with a spatially heterogeneous arrangement of regions of optically clear and dyed silicone-based rubbers, which can either be distributed in periodic arrays or randomly. Our devices can discretely transition from clear to opaque or exhibit a continuous variation of their transmittance depending on: the geometry of the substructure, the material properties of the components and the mode of loading. We evaluate the optical response of our color-composite structures through precision experiments and investigate the underlying mechanics through finite element modeling, which we use to systematically further explore the design space.

Francisco Lopez Jimenez
Massachusetts Inst of Tech-MIT

Date submitted: 13 Nov 2014

Electronic form version 1.4