

Abstract Submitted  
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**Simulating Composite Materials with Giant Anisotropy** JUSTIN  
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VIKTOR PODOLSKIY, Oregon State University — We study the optical properties  
of a novel class of composite materials based on plasmonic nanostructures embedded  
into a dielectric host. Due to the phenomena of plasmon resonance, the plasmonic  
inclusions have a dramatic effect on the effective dielectric constant of the system  
even when the concentration of inclusion is small. We develop a numerical technique  
to simulate these structures, and compare the numerical results to the generalized  
Maxwell-Garnett predictions. We demonstrate that in contrast to most bulk media  
where the difference between the values of dielectric constant in different directions  
is of the order of a few percent, the effective anisotropy of the proposed structures  
can exceed 100%. Proposed applications include polarizers, reflectors, high-energy-  
density nano-waveguides, and the recently discovered non-magnetic low-loss left-  
handed media.

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