

Abstract Submitted
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Optical Metamaterials at Near IR Range Fabricated by Nanoimprint Lithography E. KIM, UC Berkeley, W. WU, E. PONIZOVSKAYA, HP Labs, Y.R. SHEN, UC Berkeley, A. BRATKOVSKY, S.Y. WANG, HP Labs, UC BERKELEY TEAM, HP LABS TEAM — Metamaterials operating at near-IR frequencies have been designed, fabricated by nanoimprint lithography (NIL), and characterized by laser spectroscopic ellipsometry. The structure was a metal/dielectric/metal stack “fishnet” structure that demonstrated negative permittivity and permeability in the same frequency region and hence exhibited a negative refractive index at a wavelength near 1.7 micron. The results of the transmittance and the reflectance measurements of the “fishnet” structure show a strong resonance appears in the vicinity of 1.67 micron. This resonance comes from the negative permittivity combined with the magnetic resonance. The position of the resonance agrees with predictions from FDTD simulation. This work demonstrates the feasibility of designing various optical negative-index metamaterials and fabricating them using the NIL as a low-cost, high-throughput fabrication approach.

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