

Superlensing with plane plates consisting of dielectric cylinders in glass envelopes

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Abstract

The approach of designing negative-refractive-index materials on the basis of dielectric rods with a gradient of the dielectric constant is tested experimentally. A triangular-lattice plane-parallel slab assembled from multilayer dielectric rods with a refractive index approximating a fish-eye profile is shown to exhibit excellent focusing properties for the TM polarized electromagnetic radiation at frequencies defined by the structural parameters of the slab. A clearly defined super-resolution effect is observed at corresponding frequencies, the width of the focal spot down to a quarter of the wavelength being achieved. The experimental data are partially verified by simulations which show a very good match to the measurements.