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Focusing by plano-concave lens using negative refraction
PLARENTA VODO, PATANJALI PARIMI, WENTAO LU, SRINIVAS SRIDHAR, Department of Physics and Electronic Materials Research Institute (EMRI), Northeastern University, Boston, MA. — We demonstrate experimentally focusing of plane waves at microwave frequencies by a plano-concave lens using negative refraction. The lens was fabricated from a microwave dielectric photonic crystal acting as a left-handed metamaterial. The inverse experiment where the source is placed at the observed focal point was also performed and shows clearly an emerging plane wave. The focal point is observed to move with the radius of curvature of the lens. Different radii of curvature have different frequency ranges of focusing all of which lie in the second band frequencies along Γ-X propagation direction of the photonic crystal. The measured values of refractive index are in complete agreement with those determined from band structure calculations. Work supported by AFOSR and NSF-PHY-0098801.

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