

# **Strongly frequency dependent focusing efficiency of a concave lens based on two-dimensional photonic crystals**

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## **Abstract**

Results of an experimental study of a concave lens based on a two-dimensional microwave photonic crystal with  $n_{\text{eff}} < 1$  are shown. We demonstrate that the lens focuses electromagnetic radiation for transverse electric (TE) and transverse magnetic (TM) polarizations. Intensity gains as high as 5.4 for TE polarization and 6.3 for TM polarization were achieved for definite frequencies lying in the explored interval from 6 to 15 GHz, the smallest area of the focal spot being equal to  $0.24\lambda^2$  and  $1.02\lambda^2$  for TE and TM polarizations respectively. The proposed lens serves as a model system that can be scaled to THz and optical frequencies.

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