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Focusing effect of photonic crystal concave lenses made from porous dielectrics

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Abstract

In the present paper we show the photonic band structure and transmittance spectra of photonic crystal (PC) consisting of porous dielectric and compare the results with the earlier published. Frequency ranges, where PC can be ascribed an effective index of refraction, are given and approximately indicated on the transmittance spectra. This helps to identify optical elements' properties made of porous dielectric: lenses in our case. The focusing effect of PC concave lens, working in the long wavelength limit and spectral regions with a negative refractive index, is investigated. We prove the good focusing effect of such lenses that can be easily fabricated.