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Title: Reconfigurable gradient index using VO(2) memory metamaterials
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Abstract: We demonstrate tuning of a metamaterial device that incorporates a form of spatial gradient control. Electrical tuning of the metamaterial is achieved through a vanadium dioxide layer which interacts with an array of split ring resonators. We achieved a spatial gradient in the magnitude of permittivity, writeable using a single transient electrical pulse. This induced gradient in our device is observed on spatial scales on the order of one wavelength at 1 THz. Thus, we show the viability of elements for use in future devices with potential applications in beamforming and communications. (C) 2011 American Institute of Physics.