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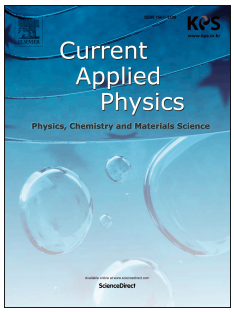

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Unipolar Photonic Memristive-like Nonlinear Switching in Split-Ring Resonator Based Metamaterials

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Abstract: Photonic memristor, which perform the function as memristor working on electromagnetic fields, can accelerate the development of all-optical network. A unipolar photonic memristive-like switching behavior in split-ring resonator based metamaterials was reported. Transmission- power (*T-P*) loops are observed in the metamaterials. And the *T-P* loops change with the detect frequency which indicates the tunability and designability of the photonic memristor. These behaviors are attributed to the increasing dielectric constant of $MgTiO_3$ ceramic caused by the interaction of sample and electromagnet field. The mechanism supplies a general foundation for photonic memristors which can be used from radio frequency to optical wavelength.

Keywords: Photonic memristor; metamaterials; split-ring resonator