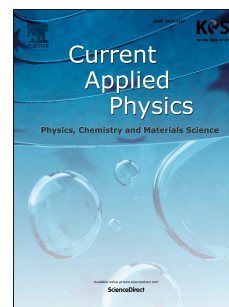


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## Unipolar Photonic Memristive-like Nonlinear Switching in Split-Ring Resonator Based Metamaterials

Hongya Wu<sup>1,2\*</sup>, Liang Xu<sup>1</sup>, Shikao Shi<sup>3</sup>, Guanglei Zhang<sup>1</sup>, Guoqiang Qin<sup>1</sup>, Caihui Wang<sup>1</sup>, Gang Yu<sup>1</sup>, Ji Zhou<sup>2\*</sup>, and Shuzhi Zheng<sup>4\*</sup>

<sup>1</sup>*School of Materials Science and Engineering, Shijiazhuang Tiedao University, Shijiazhuang, Hebei 050043, People's Republic of China*

<sup>2</sup>*State Key Laboratory of New Ceramic and Fine Processing Tsinghua University, Beijing 100084, People's Republic of China*

<sup>3</sup>*College of Chemistry & Materials Science, Hebei Normal University, Shijiazhuang, Hebei 050024, People's Republic of China*

<sup>4</sup>*School of Professional Techniques, Hebei Normal University, Shijiazhuang, Hebei 050024, People's Republic of China*

E-mail: hongya03106105@163.com, zhouji@mail.tsinghua.edu.cn, onlyone1966@sina.com

**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  $\text{MgTiO}_3$  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

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