

THE MEMRISTOR: FREQUENCY RESPONSE OF A HYSTERETIC DEVICE

Natalia C. Meijome (Yogesh N. Joglekar), Department of Physics, Purdue School of Science, Indiana University–Purdue University Indianapolis, Indianapolis, Indiana 46202

The memristor, postulated in the 1970's, was recently realized in a titanium dioxide thin-film device and is now being commercially developed. Memristor, short for memory resistor, is the fourth fundamental circuit element whose instantaneous resistance depends not only on the voltage, but also on the history of the voltage applied to it. We investigate the frequency response of the current through a memristor due to an externally applied periodic voltage with the application of an algorithmic code using MATLAB. With these results, we are able to understand the characteristic response that this device displays for each corresponding input voltage frequency. Due to the range of response exhibited, there is the possibility of using this device in circuits to produce entirely new functions. We expect that this analysis will have implications for scientific advancement in both circuitry development as well as neuroscience due to a memristor's ability to perform logic operations and store information.

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