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Electrical Characterization of Flexible Titanium Dioxide Memristors VICTORIA ROSBOROUGH, NADINE GERGEL-HACKETT, Mary Baldwin College — The memristor is a new fundamental circuit element with a resistance that depends on the magnitude and polarity of the voltage applied to it and the length of time that voltage is applied. Memristors are also nonvolatile, which means that when the bias is removed, a memristor retains its last resistive state. While memristors have potential applications ranging from alternative computer architectures to memory in inexpensive lightweight wearable sensors, the mechanism behind its switching is not well understood. One of the major questions to be resolved is whether memristive switching is electric field dependent or charge dependent. In the former case, a minimum bias is needed for switching to occur. In the latter case, a minimum amount of charge needs to pass through the device to cause switching. I will present the results of electrically characterizing flexible memristors that consist of a nm-thick layer of titanium dioxide sandwiched between two metal contacts in an effort to help establish whether their switching is charge or field-driven.

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