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Voltage triggered resistance switching in two terminal VO_2 nano-junctions fabricated by electron-beam lithography GOKUL GOPALAKRISHNAN, DMITRY RUZMETOV, CHANGHYUN KO, VENKATESH NARAYANAMURTI, SHRIRAM RAMANATHAN, School of Engineering & Applied Sciences, Harvard University — Vanadium dioxide (VO_2) thin films have been shown to undergo an abrupt decrease in resistivity, both in response to increasing temperature as well as an increasing electric field. The ultra-fast electrically triggered transition has made VO_2 an exciting platform to explore a range of potential applications, from high speed switches to memory elements. Particularly valuable to such investigation is characterization of the electronic properties of VO_2 thin films, in which transport is additionally constrained within nanoscale dimensions along the in-plane directions. In this poster, we describe the results of transport measurements on VO_2 nanojunctions grown on a conductive substrate and patterned by electron-beam lithography. We analyze the out-of-plane I-V data and present a detailed discussion on electron transport mechanisms and on the origin behind the electrically triggered conductivity jumps that we observe in these nano-junctions.

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