Abstract Submitted
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Electrically tunable transport and resistive switching in doped Ca_2RuO_4 SHIDA SHEN, MORGAN WILLIAMSON, The University of Texas at Austin, GANG CAO, University of Colorado-Boulder, JIANSHI ZHOU, JOHN GOODENOUGH, MAXIM TSOI, The University of Texas at Austin — We study electronic transport properties of Cr doped (2.5%) Mott insulator Ca_2RuO_4 where electric fields were previously found [1] to induce an insulator-to-metal switching with potential industrial applications. In our experiments we observe a continuous reduction in the resistivity of Ca_2RuO_4 as a function of increasing electrical bias followed by an abrupt switching at higher biases. Interestingly, the observed switching is non-destructive and requires opposite bias polarities to switch from high-to-low and low-to-high resistance states. Combination of 2-, 3-, and 4-probe measurements provide a means to shed light on the origin of the switching and distinguish between its bulk and interfacial contributions. This work was supported in part by C-SPIN, one of six centers of STARnet, a Semiconductor Research Corporation program, sponsored by MARCO and DARPA, by NSF grants DMR-1600057, DMR-1265162, and DMR-1122603, and by the King Abdullah University of Science and Technology (KAUST) Office of Sponsored Research (OSR) under Award No. OSR-2015-CRG4-2626. [1] F. Nakamura et al., Sci. Rep. 3, 2536 (2013).

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