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Imaging and Electric Control of Boundary Magnetization and Exchange Bias in Chromia and Chromia/CoPd XI HE, Univ. of Nebraska, Lincoln, NE, NING WU, Univ. of Nebraksa, Lincoln, NE, YI WANG, ALEKASANDER WYSOCKI, TAKASHI KOMESU, KIRILL BELASHCHENKO, PETER DOWBEN, CHRISTIAN BINEK, Univ. of Nebraska, Lincoln, NE, UDAY LANKE, Canadian Light Source Inc., Saskatoon, Canada, ANTHONY CARUSO, Univ. of Missouri, Kansas City, ELIO VESCOVO, Brookhaven National Lab. NY — Promising spintronic concepts utilize electric control of boundary magnetization. Symmetry arguments predict that the magnetoelectric antiferromagnet (AF) Cr_2O_3, has a roughness insensitive surface magnetization which is coupled to the bulk AF order parameter. We provide macroscopic and microscopic evidence for this surface magnetization and its electric control. The latter is exploited in perpendicular exchange bias heterostructures where a ferromagnetic Pd/Co multilayer is deposited on the (0001) surface of a Cr_2O_3 single crystal. These heterostructures show reversible, room-temperature voltage-controlled switching of the exchange-bias field between positive and negative values.[1] This work is supported by NSF Career, NSF MRSEC, NRI, and Research Corporation.

[1]Xi He, et al. Nature Materials **9**, 579 (2010)

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