

Abstract Submitted
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Pulsed Laser Deposition of $\text{Cr}_{2-x}\text{Fe}_x\text{TeO}_6$ Thin Film¹ JUNLEI WANG, KIRILL D. BELASHCHENKO, PETER A. DOWBEN, CHRISTIAN BINEK, Department of Physics & Astronomy, University of Nebraska-Lincoln — Promising spintronic concepts such as Cr_2O_3 based voltage-controlled exchange bias system [1] employ electric controlled boundary magnetization. Symmetry arguments reveal that equilibrium boundary magnetization is a generic property of magnetoelectric antiferromagnets [2]. However, experimental evidence of the boundary magnetization is scarce. Here we explore non-traditional growth of magnetoelectric oxides with tri-rutile structure using pulsed laser deposition (PLD) methodology. We grow and characterize structurally and magnetically various magnetoelectric thin films of the $\text{Cr}_{2-x}\text{Fe}_x\text{TeO}_6$ family starting from $x=2$ in order to take advantage of the reduced chemical complexity of Fe_2TeO_6 and the beneficial high temperature onset of antiferromagnetic order at 230K in comparison to 90K of Cr_2TeO_6 . Our investigation aims on an experimental test of the predicted generality of the equilibrium boundary magnetization in magnetoelectric antiferromagnets.

[1]. He, Xi et al., Nature Materials 9, 579 - 585 (2010)

[2]. Belashchenko, K.D., Phys. Rev. Lett. 105, 147204 (2010)

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Junlei Wang
Department of Physics & Astronomy, University of Nebraska-Lincoln

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