

Abstract Submitted  
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**Magnetic and structural properties of Sr<sub>2</sub>CrReO<sub>6</sub> epitaxial films fabricated by ultra-high vacuum sputtering**<sup>1</sup> A.J. HAUSER, B. PETERS, J. SOLIZ, R.E. WILLIAMS, M. DIXIT, H.L. FRASER, P.M. WOODWARD, F.Y. YANG, The Ohio State University — Sr<sub>2</sub>CrReO<sub>6</sub>, a double-perovskite half-metallic ferromagnet, has attracted much attention due to its high T<sub>c</sub> of 620 K. However, balancing the stoichiometry and ordering of a quaternary oxide is no trivial matter. We have deposited pure-phase Sr<sub>2</sub>CrReO<sub>6</sub> epitaxial films on SrTiO<sub>3</sub> substrates by ultrahigh vacuum off-axis magnetron sputtering with precise control of the oxygen partial pressure and in-situ monitoring by high-pressure residual gas analyzer. The films exhibit saturation magnetization at T = 5K approaching 0.9 Bohr magnetons per formula unit and T<sub>c</sub> close to 600 K. X-ray diffractometry spectra demonstrate epitaxy and phase purity with a rocking curve FWHM of 0.012 degrees. Laue oscillations give evidence of exceptionally smooth surface and interface as well as precise film thickness determination. Finally, direct observation of the films by HAADF STEM show nearly defect free films with double-perovskite ordering. We will discuss the effects of stoichiometry, growth pressure and oxygen content on sample properties.

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