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Electronic and Magnetic Tunability of Sr_2CrReO_6 Thin Films by Growth-mediated Oxygen Modulation and Template Variation JEREMY LUCY, The Ohio State University — Highly ordered epitaxial films of ferrimagnetic semiconductor Sr_2CrReO_6 have been fabricated by off-axis magnetron sputtering, and characterized as a function of the oxygen partial pressure at optimal growth conditions. In this letter, we report 18,000% modulation in electrical resistivity at T= 7K (60% at room temperature) from a 1% modulation in the oxygen partial pressure during film growth. The growth window was chosen to center around the condition for peak saturation magnetization, which drops due to both increasing and decreasing oxygen growth pressure. The results suggest that n-type doping from oxygen vacancies in the film likely play the dominant role in the electrical properties and modulation of Sr_2CrReO_6 thin films. We also explore the effects of substrate templates on the structural, electrical, and magnetic properties of Sr_2CrReO_6. Sr_2CrReO_6 films fabricated on double perovskite substrates or buffer layers exhibit increased resistivities at low temperatures.

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