Abstract Submitted
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Synthesis and Characterization of Epitaxial Nd2Ir2O7 Thin Films Fabricated with Off-Axis Magnetron Sputtering[1] JAMES GALLAGHER, ROBERT WILLIAMS, SAM WAGERS, DAVID MCCOMB, FENGYUAN YANG, Ohio State Univ - Columbus — There has been a recent interest in the study of 5d transition metal oxides due to the large spin-orbit coupling. In particular, the pyrochlore iridates $A_2Ir_2O_7$ are a group of interesting materials with geometric frustration of magnetic moments and large spin-orbit coupling, allowing the possibility of Mott insulators, topological insulators and Weyl semimetals. $Nd_2Ir_2O_7$ is of particular interest because it is near the metal-insulator transition, making it a potential candidate for search of topological insulators and Weyl semimetals. We grow pure phase, fully epitaxial $Nd_2Ir_2O_7$ thin films using ultrahigh vacuum off-axis magnetron sputtering on yittrium-stabalized zirconia. X-ray diffraction verified that the pure phase epitaxial relationship of the film to the substrate. Scanning transmission electron microscopy (STEM) images reveal the pyrochlore ordering between Nd and Ir and epitaxial nature of the film. Transport measurements show that the films undergo a metal-insulator transition around 70 K, up from around 35 K in the bulk.

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