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**Thin Film Study of YFeO<sub>3</sub> Deposited Via Pulsed Laser Deposition for Use in Spintronic Applications** ADAM HINCKLEY, RAM GUPTA, YESAPPA KOLEKAR, KARTIK GHOSH, PAWAN KAHOL, Missouri State University — Recently, rare-earth orthoferrites have received much attention. Their propensity for multiferroic capabilities could play a key role in the fabrication of an efficient spintronic system. Such materials as BiFeO<sub>3</sub> and CeFeO<sub>3</sub> have already shown promise for uses in microphotonics as well as acting as spin valves, where YFeO<sub>3</sub> has been shown to exhibit weak ferromagnetic tendencies in bulk. However, research conducted on the magnetic and electrical properties of YFeO<sub>3</sub> thin films are sparse and in need of further investigation. Hence we have developed bulk YFeO<sub>3</sub> for the purpose of investigating these thin film properties. Films will be grown via KrF Pulsed Laser Deposition on LaAlO<sub>3</sub> substrates due to their similar lattice constant values and characterized via X-Ray Diffraction, Hall Effect Analysis and SQUID Magnetometer examinations. Previous SQUID results from the bulk material display an inverted hysteresis loop, indicating the existence of differing magnetic phases in bulk. Our goal is to examine the effects from thin film construction on these magnetic phases and examine whether thin films of YFeO<sub>3</sub> exhibit a coupling between magnetic and electrical phases. This work is supported by National Science Foundation (Award Number DMR- 0907037).

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