

Abstract Submitted
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Optimization of Thick, Large Area YBCO Film Growth Through Response Surface Methods¹ J. PORZIO, C.H. MAHONEY , M.C. SULLIVAN , Ithaca College — We present our work on the optimization of thick, large area $\text{YB}_2\text{C}_3\text{O}_{7-\delta}$ (YBCO) film growth through response surface methods. Thick, large area films have commercial uses and have recently been used in dramatic demonstrations of levitation and suspension. Our films are grown via pulsed laser deposition and we have optimized growth parameters via response surface methods. Response surface methods is a statistical tool to optimize selected quantities with respect to a set of variables. We optimized our YBCO films' critical temperatures, thicknesses, and structures with respect to three PLD growth parameters: deposition temperature, laser energy, and deposition pressure. We will present an overview of YBCO growth via pulsed laser deposition, the statistical theory behind response surface methods, and the application of response surface methods to pulsed laser deposition growth of YBCO. Results from the experiment will be presented in a discussion of the optimized film quality.

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