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Local Electro-Optic Response of Strained SrTiO₃ Films Grown on DyScO₃ HONGZHOU MA, JEREMY LEVY, Department of Physics and Astronomy, University of Pittsburgh, Pittsburgh, PA 15260, MIKE D. BIEGALSKI, DARRELL G. SCHLOM, SUSAN TROLIER-MCKINSTRY, Materials Research Institute, Pennsylvania State University, University Park, PA 16802, R. UECKER, P. REICHE, Institute of Crystal Growth, Rudower Chaussee 6, D-12489 Berlin, Germany — The electro-optical response of SrTiO₃ thin films grown on DyScO₃ substrates was studied with confocal scanning optical microscopy (CSOM) and apertureless near-field scanning optical microscopy (ANSOM). The polarization dependent electro-optical coefficients reveal that the c axis of the strained SrTiO₃ is oriented in-plane along the (110) and (-110) directions. The hysteretic electro-optic response at room temperature results from uniform strain in the SrTiO₃ film. Time-resolved ANSOM is used to study the domain dynamics at microwave frequencies. This work was supported by the National Science Foundation through grants DMR-0103354 and DMR-0333192, and the U.S. Department of Energy through contract W-31-109-ENG-38.

Hongzhou Ma
Department of Physics, University of Pittsburgh

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