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Optical anisotropy in the metal-to-insulator transition in VO_2 thin films MATT T. SIMONS, ELIZABETH RADUE, LEI WANG, William & Mary Coll, S. KITTIWATANAKUL, J. LU, S.A. WOLF, University of Virginia, R.A. LUKASZEW, IRINA NOVIKOVA, William & Mary Coll — The metal-to-insulator transition in vanadium dioxide (VO_2) is being explored for a variety of uses, ranging from opto-electronic switches to nanoparticle coatings for smart windows. The mechanisms behind this transition as well as methods for altering the transition properties are the focus of continuing studies. In particular, the properties of VO_2 thin-films are affected by the structure of the underlying substrate material that can influence the temperature, width, and other characteristics of the phase transition. We investigate the anisotropy of the time-resolved optical measurements in an ultrafast photo-induced MIT transition in VO_2 on different substrates, including rutile (TiO_2) and sapphire (Al_2O_3). We observe that the optical anisotropy varies with the fluence of the pump used to induce the phase transition on the TiO_2 substrate.

Matt T. Simons
William & Mary Coll

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