

Abstract Submitted
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Study of microstructure effects on the photo-induced Metal-insulator transition in VO₂ thin films grown on Al₂O₃ and TiO₂¹ ELIZABETH RADUE, LEI WANG, College of William and Mary, SALINPORN KITTIWATANAKUL, JIWEI LU, STUART WOLF, University of Virginia, ENRICO ROSSI, R.A. LUKASZEW, IRINA NOVIKOVA, College of William and Mary — We studied the optical response of the VO₂ thin films undergoing photo-induced metal-insulator transition (MIT) of VO₂ and found the change in reflectivity over time to be highly dependent on the substrate on which the film was grown [1]. Specifically, we have looked at two different VO₂ thin film samples, one grown on TiO₂ and one grown on Al₂O₃, in a pump-probe configuration, and found that the strain and differences in microstructure resulted in substantial difference in the fluence threshold needed to induce MIT, as well in the relaxation times back to the insulating state. By mounting the films in a cryostat, we also found that the fluence needed to achieve full MIT for the film on TiO₂ substrate did not depend on the sample temperature, implying that different mechanisms may be playing a stronger role in one film rather than the other for an optically induced transition.

[1] E. Radue et al. arXiv:1410.6438 (2014)

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