Abstract Submitted
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Study of Insulator-Metal transition of VO_2 thin films with ultrafast optical pulses[1] ELIZABETH RADUE, LEI WANG, The College of William and Mary, EVAN CRISMAN, Department of Physics, The College of William and Mary, RUSSELL WINCHESKI, NASA-Langley Research Center, S. KITTIWATANAKUL, J. LU, S.A. WOLF, Department of Physics, University of Virginia, ROSA LUKASZEW, IRINA NOVIKOVA, The College of William and Mary — VO_2 has been a popular material to study in the past few decades as it has a reversible insulator-metal transition (IMT) when heated past 340K or stimulated with an ultrafast optical pulse. The resistance and optical properties change by several orders of magnitude, making it an attractive candidate for low loss plasmonic devices, ultrafast switches, or smart windows. We study the dynamics of the transition of VO_2 thin films on different substrates with femtosecond pulses in a pump-probe experiment in order to better understand the mechanisms behind the transition. We have measured the IMT at several different temperatures to investigate any change in the dynamics of the transition. We also study the Raman spectroscopy of VO_2 thin films heated through the transition. The effects of the different substrates on the transition of the VO_2 thin film will be discussed.

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