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Optical properties of structurally modified VO₂ MING YANG, MINA AZIZIHA, LOGAN LANG, WEITAO DAI, CHENG CEN, West Virginia Univ — Pristine vanadium dioxide (VO₂) undergoes a phase transition from insulating monoclinic structure to metallic rutile structure at around 343 K. In our studies, by using scanning probe technique, different structural phases of vanadium oxides can be spatially patterned from pristine VO₂ thin films at room temperature. Time-resolved pump-probe measurements were performed at different temperatures to investigate the electronic and phonon characteristics in each phases. Time-resolved Kerr rotation measurements were also taken to analyze the spin dynamics. Interestingly, laser-induced phase transition in VO₂ that is highly stable in vacuum was also found in our experiments. Our results are not only important for the fundamental studies, but also can lead to fascinating multifunctional, broadband device applications.

Ming Yang
West Virginia Univ

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