

Abstract Submitted
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Physical properties of VO₂ and V₂O₃ nanowires.¹ WEI CHEN, JIANG WEI, DAVID COBDEN, University of Washington — Both VO₂ and V₂O₃ show dramatic metal-insulator transitions, whose manifestations on the nanoscale are not known. We investigate techniques to differentiate and pattern the metallic and insulating domains in small VO₂ crystals and nanowires grown by vapor phase deposition. For instance, it has been reported that insulating VO₂ can be metallized by electron beam exposure and by hydrogenation. We attempt to distinguish the domains by scanning probe techniques, including topography and electric force microscopy, and observe a pinning effect of the domains by oscillating strain variations when the nanowire is attached to a substrate. When the strain is released by etching, the pinning is removed. The VO₂ crystals can be converted to V₂O₃ crystals by reducing in hydrogen and annealing. By patterning the V₂O₃ on the nanoscale we aim to realize strongly correlated quantum dots.

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