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Growth and Structural Characterization of RuO₂/VO₂ Bilayers for Tunneling Spectroscopy ALI AMIRI, JOSH JONES, PATRICK LECLAIR, ARUNAVA GUPTA, University of Alabama - Tuscaloosa — Vanadium dioxide is one of the most studied oxides for its sharp metal to insulator transition near room temperature (340 K). Various experimental and theoretical approaches are still going on to make a proper and comprehensive understanding of this transition. Heterostructures of VO₂ and RuO₂ are of interest for tunneling studies. The purpose of this experiment is to study the transport properties of VO₂ far below the metal-insulator transition temperature (MIT). This will make it possible to understand the nature of the ground state and to investigate the excitations in VO₂ strongly correlated electron system. To make these heterostructures, the epitaxial films of RuO₂ are grown on TiO₂ (100) substrates. Subsequently, an epitaxial VO₂ film is grown in-situ on RuO₂. Both films are grown in a low pressure chemical vapor deposition system. The structural characterization by XRD confirms the epitaxial growth. The morphology studies by atomic force microscopy show a smooth film with about 1nm of roughness. Finally, the resistance measurement versus temperature demonstrates the superposition of the transport behaviors of these two isostructural films.

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