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Scanning Photocurrent Microscopy of VO_2 Nanobeams CHRISTOPHER MILLER, MARK TRIPLETT, JOEL LAMMATAO, University of California, Davis, KEVIN WANG, DERRICK FU, JUNQIAO WU, University of California, Berkeley, DONG YU, University of California, Davis — Vanadium dioxide (VO_2) is a strongly correlated material that displays a near-room temperature metal-to-insulator transition ($\sim 68^oC$). This transition can be explored at the single domain level in single crystalline VO_2 nanobeams, where the material dimension is smaller than the characteristic domain size. Here we investigate the metal-insulator phase transition and its domain wall physics in single VO_2 nanobeam devices through scanning photocurrent microscopy. This technique, which measures the photocurrent as a function of the local photo-injection position, allows us to determine the band bending direction and the height of the Schottky barriers at each domain wall. Our results may shed light on the charge dynamics in strongly correlated materials and the metal-insulator phase transition mechanism.

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