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Imaging the dynamics of single vortices on grain boundaries in $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ thin films B. KALISKY, B. NOWADNICK, Geballe Laboratory for Advanced Materials, Stanford University, S. WENDERICH, Faculty of Science and Technology and MESA+ Institute for Nanotechnology, University of Twente, E. ZELDOV, Department of Condensed Matter Physics, Weizmann Institute of Science, J. KIRTLEY, IBM Research Division, Yorktown Heights, A. ARIANDO, H. HILGENKAMP, Faculty of Science and Technology and MESA+ Institute for Nanotechnology, University of Twente, K. A. MOLER, Geballe Laboratory for Advanced Materials, Stanford University — We use a scanning Hall probe microscope with single vortex resolution to study the dynamics of single vortices on grain boundaries in $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$ thin films with 10 kHz bandwidth. In the presence of an applied current, we observe individual vortices hopping between pinning sites. Detecting the motion of individual vortices allows us to probe the very- low-voltage regime of the current -voltage ($I - V$) characteristic, at voltage levels of $2 \cdot 10^{-15}$ V. By scanning the grain boundary we show local $I - V$ curves and investigate the statistical processes at the onset of vortex motion.

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