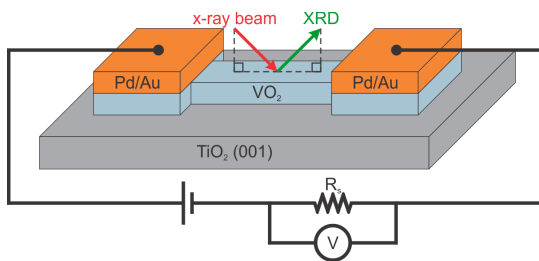
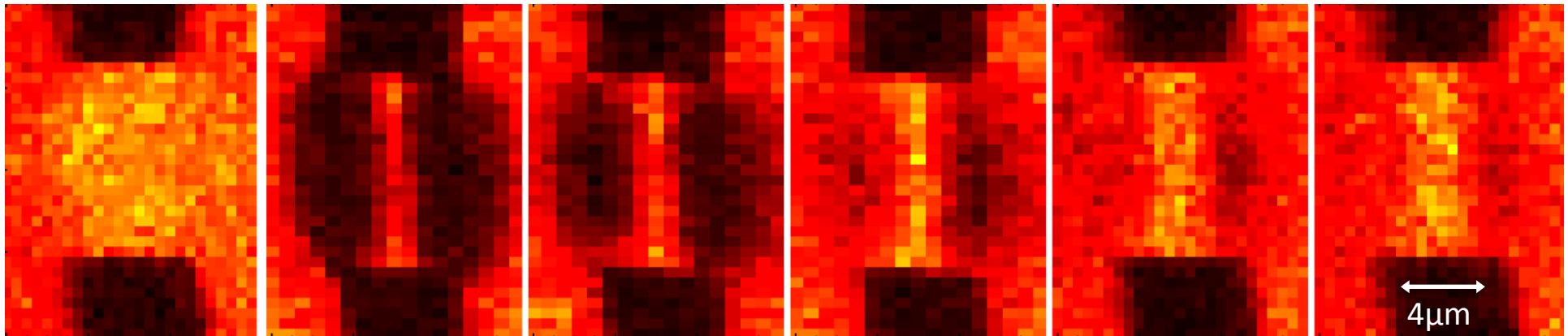
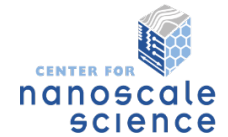


Structural Aftershocks in VO₂ Switching



The device is probed by an X-ray diffractometer with $\sim 200\text{nm}$ spatial and $\sim 1\text{ns}$ time resolution to explore the current-triggered phase transition in VO₂

A current passed through VO₂ destabilizes the monoclinic semiconducting phase and induces a phase transition to the tetragonal metallic phase. While the electronic transition to the low resistance state is very fast, a complex and unexpected spatially varying structural distortion pattern is detected, lagging behind the electronic transition. These “structural aftershocks” reveal a complex interplay of electronic and structural phase transitions in VO₂ on ultrashort time scales in a device configuration which is of high relevance for newly proposed low power logic devices, such as hyper-FETs (10.1038/ncomms8812) or VO₂ oscillator based non-Boolean computing (10.1038/srep04964).