

Near field imaging of metallic filaments in NdNiO₃ (NNO)

Adrien Bercher, Javier del Valle Granda, Claribel Dominguez, Jennifer Fowlie, Stefano Gariglio, Jean-Marc Triscone, and Alexey Kuzmenko

DQMP

Temperature- and current-controlled metal-insulator transitions (MIT) in rare-earth nickelates attract much attention nowadays. We employed scattering-type scanning near-field optical microscopy (s-SNOM) to investigate the formation of electric-current filaments in NNO thin film grown on LaAlO₃ (LAO) with a short separation between the electrodes (10 microns). The current and temperature dependence of the metallic filaments were highlighted in this experiment. We obtain good correlation between the spatial profile of the filaments and changes in the I/V curve of the device.