Circumferential Thermal Groove at a Low Angle Grain Boundary in MgO

The montage of atomic force microscope images above shows a circumferential thermal groove formed on a magnesia surface after thermal etching in air at 1400 °C. The orientations of the inner and outer grain were determined by backscattered electron diffraction; both are near <221> and misoriented with respect to one another by a 5.4 ° rotation about a common <310> axis. The grain boundary (γ_{gb}) to surface energy (γ_{s}) ratio was determined from the surface dihedral angle and plotted as a function of position on the groove (right). Anisotropies in the interfacial energies cause the systematic variation in the observed ratio.

Classification: Scanning Probe Microscopy