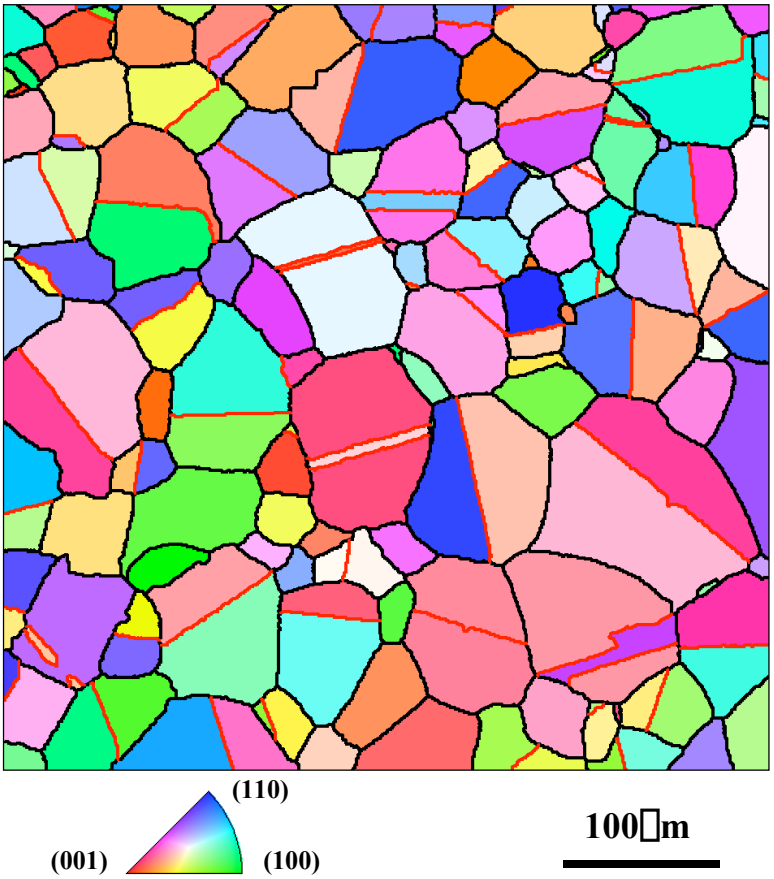
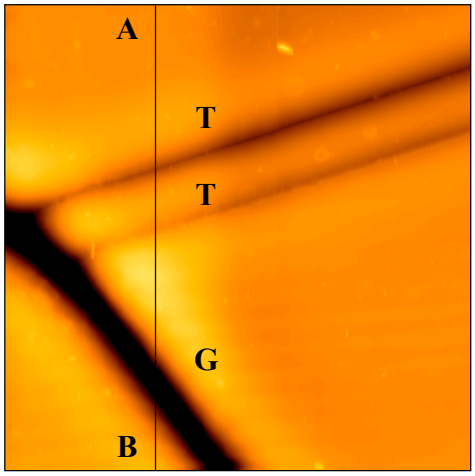
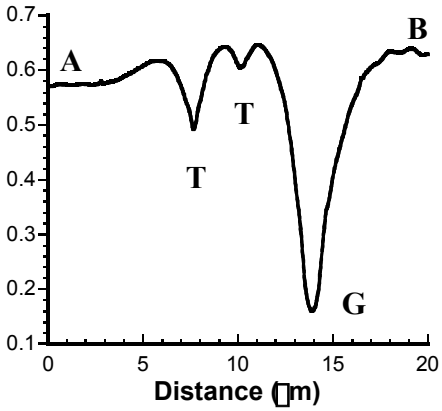
Twins in Nb-doped TiO_2







Electron backscattered diffraction mapping was used to create the orientation map (above left) which shows a large concentration of twins in a Nb_2O_5-doped TiO_2 sample treated at 1100°C for 24 h in air. The twins appear as straight boundaries, occur on {101} planes, and correspond to boundaries with a 66° rotation about [100]. In the orientation map, twin boundaries are colored red, while general boundaries are black.

The atomic force microscopy image on the right compares the dimensions of the thermal grooves formed at the twin lamellae and at a general boundary. The dihedral angles at the twins are approximately 160°, while those at general boundaries are approximately 120°.

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