

Supplementary information:

Controllable Synthesis of Single Crystal SnO₂ Nanowires and Tri-crystal SnO₂ Nanobelts

Yanjie Wei^{a1}, He Zheng^{a1}, Shuaishuai Hu^a, Shizhou Pu^a, Huayu Peng^a, Lei Li^a,
Huaping Sheng^a, Siyuan Zhou^a, Jianbo Wang^{ab} and Shuangfeng Jia^{*a}

a School of Physics and Technology, Center for Electron Microscopy, MOE Key Laboratory of Artificial Micro- and Nano-structures, and Institute for Advanced Studies, Wuhan University, Wuhan 430072, China

b Science and Technology on High Strength Structural Materials Laboratory, Central South University, Changsha 410083, China

*Email: sfjia@whu.edu.cn (Shuangfeng Jia)

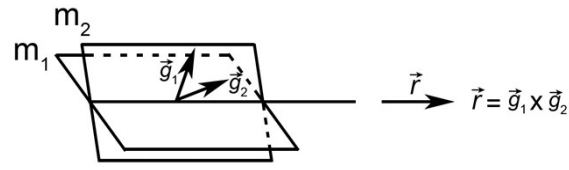


Fig. S1. Schematic illustration of determining the growth direction of NWs. \vec{g}_1 and \vec{g}_2 represent two reciprocal vectors perpendicular to the NW side-edge (axial direction), and \vec{r} indicates the growth (axial) direction of the NW.

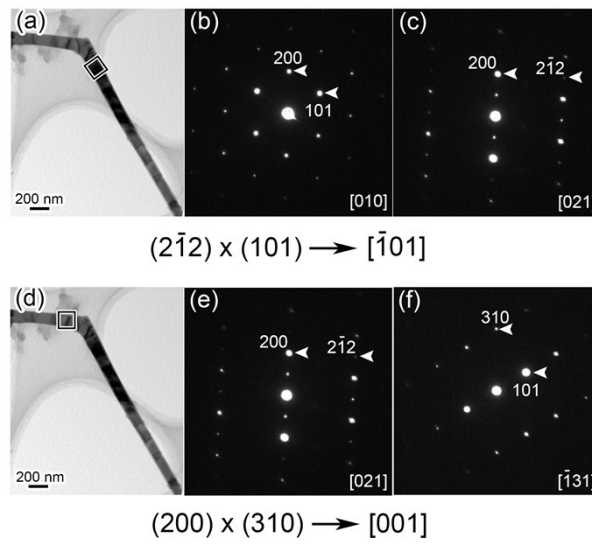


Fig. S2. The growth direction of single crystal nanowires, along from $[\bar{1}01]$ to $[001]$.

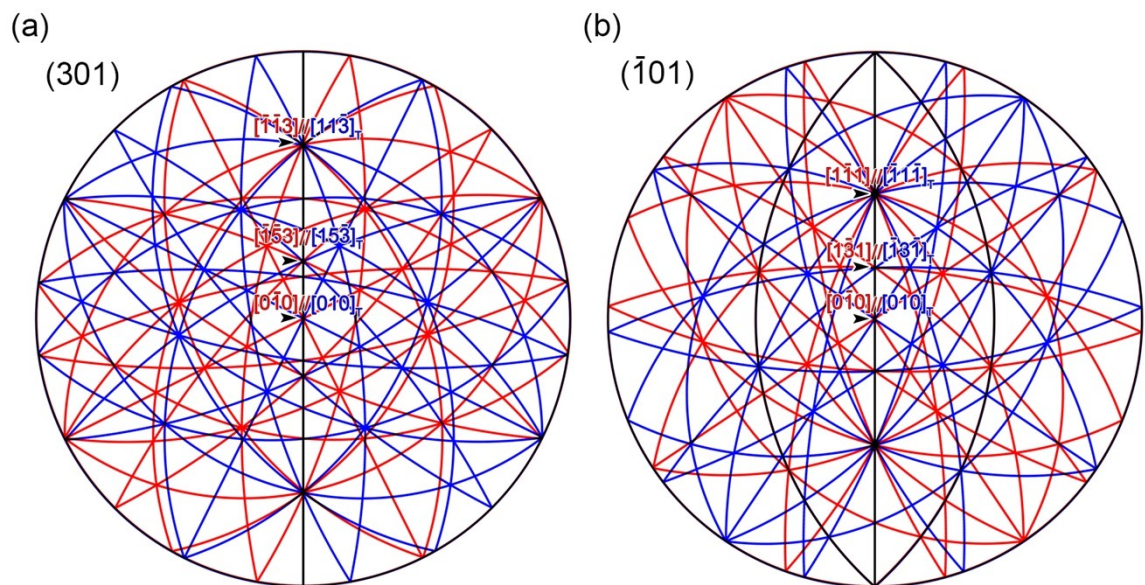


Fig. S3. (a-b) Calculated superposition stereographic projections of the Kikuchi patterns corresponding to (301) and $(\bar{1}01)$ twins.

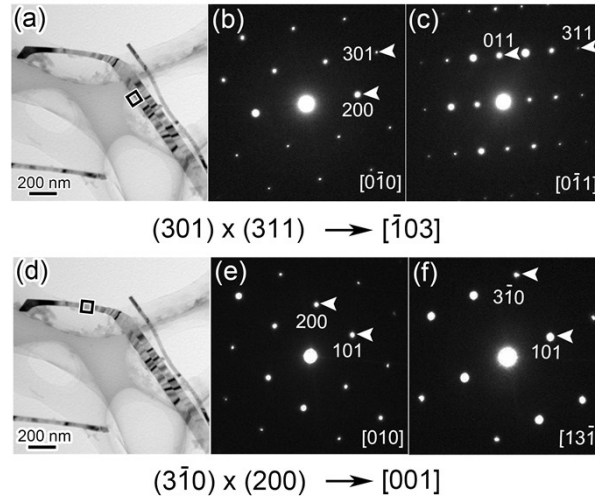


Fig. S4. The growth direction of tri-crystal nanobelts, along from $[\bar{1}03]$ to [001].

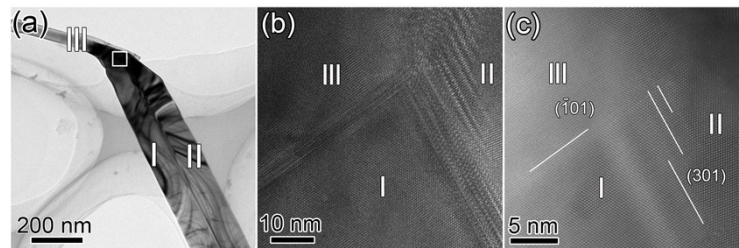


Fig. S5. (a) BF image of individual tri-crystal SnO_2 of type II. (b) The boundary of tri-crystal with a lot of defects. (c) STEM image of the tri-crystal boundary.

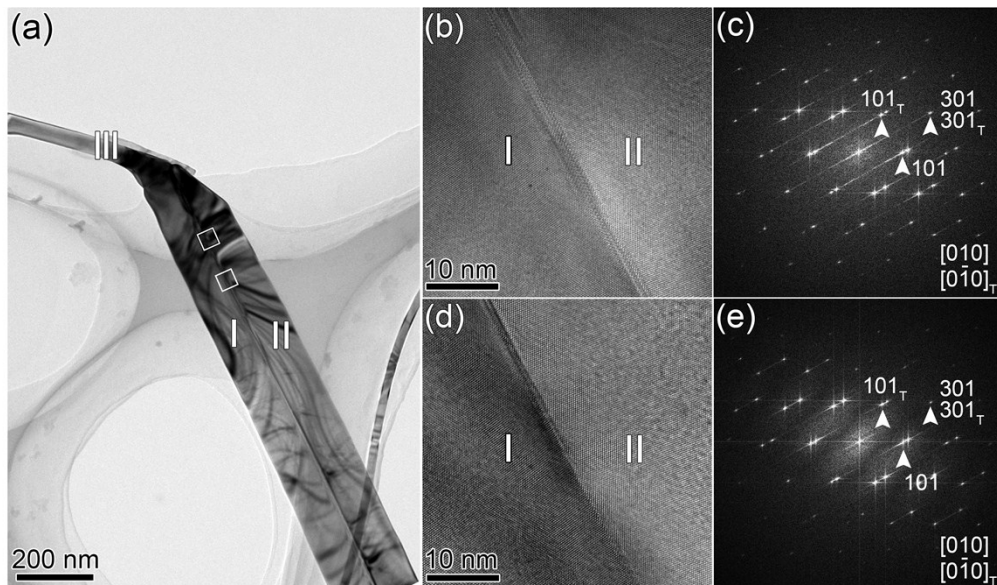


Fig. S6. (a) BF image of individual tri-crystal SnO_2 of type II. (b-c) The HRTEM image from upper rectangular area in (a) and FFT pattern corresponding to (b). (d-e) The HRTEM image from lower rectangular area in (a) and FFT pattern corresponding to (c).

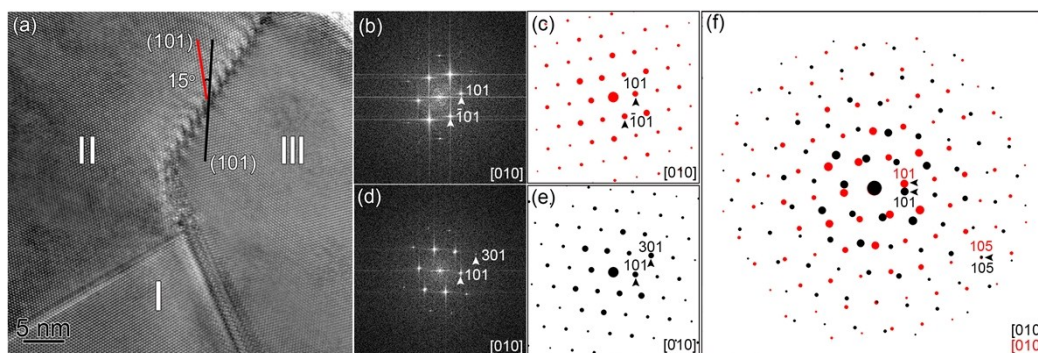


Fig. S7. (a) The HRTEM image of tri-crystal boundary. Part II clockwise rotation 15 degrees can coincide with Part III. (b-e) FFT image from part II and part III and corresponding simulated SAED patterns. (f) The superposition of (c) and (e) FFT simulations.