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Local electrical imaging of tetragonal domains and field-induced ferroelectric domains in conducting $SrTiO_3$ HAIJIAO MA, Nanocore and Physics D., NUS, S. SCHARINGER, U. Tuebingen, S.W. ZENG, Nanocore, M. LANGE, A. STHR, U. Tuebingen, Z. HUANG, T. VENKATESAN, Nanocore, R. KLEINER, U. Tuebingen, M. COEY, Nanocore, D. KOELLE, U. Tuebingen, A. ARIANDO, Nanocore and Physics D., NUS, NANOCORE TEAM, DIETER TEAM — We report intrinsic electric mapping of local conductivity due to tetragonal domains and twin boundaries in conducting STO. Multidomains and stripe monodomains were observed in different samples at low temperatures. The distribution of these domains changes on thermal cycling above the STO cubic-to-tetragonal structural transition temperature and on electric field gating. The domains split into narrower domains when we applied side gating and we attributed this to field-induced ferroelectric domain. Twin boundaries with different orientations were observed. Angles of these domain boundaries in (110) plane are 0, 55, 125 and 145 degrees. These angles were calculated from the intersection of twin planes and substrate cutting orientation. The domains split into narrower domain segments when T decreases below 30 K.

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