

Abstract Submitted
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Fractal nature of metallic and insulating domain configurations in nearly grain-boundary-free VO₂/TiO₂ thin films AHRUM SOHN, Ewha womans university, TERUO KANKI, HIDEKAZU TANAKA, Osaka university, DONG-WOOK KIM, Ewha womans university — We investigated evolution of the surface work function (W_S) maps of epitaxial 15-nm-thick VO₂/TiO₂ thin films using Kelvin probe force microscopy (KPFM) measurements while the film undergoes the metal-insulator transition (MIT). The metallic and insulating domains coexist in the VO₂ thin films during the transition, since the MIT is the first-order phase transition. Nearly grain-boundary-free samples allowed observation of metallic and insulating domains with distinct W_S values, throughout the transition. Each domain allowed us to obtain real space domain maps with nanoscopic spatial resolution. The two-dimensional percolation model well explained the relationship between the metallic domain fraction and the measured the resistivity. The domain maps also suggested that the percolation clusters formed a fractal surface.

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