

Abstract Submitted
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Separation observation of metal-insulator transition and structural phase transition in VO₂ HYUN-TAK KIM, BONG-JUN KIM, YONG WOOK LEE, BYUNG GYU CHAE, SUN JIN YUN, SOO-YOUNG OH, ETRI in Korea, YONG-SIK LIM, Konkuk U. — An intermediate monoclinic metal phase between the metal-insulator transition (MIT) and the structural phase transition (SPT) is observed with VO₂-based two-terminal devices and can be explained in terms of the Mott MIT. The conductivity of this phase linearly increases with increasing temperature up to $T_{SPT} \approx 68^\circ\text{C}$ and becomes maximum at T_{SPT} . The SPT is confirmed by micro-Raman spectroscopy. Optical microscopic observation reveals the absence of a local current path in the metal phase. The current uniformly flows throughout the surface of the VO₂ film when the MIT occurs. This device can be used as a programmable critical temperature sensor. (References: New J. Phys. 6 (1994) 52 (<http://www.njp.org>); Appl. Phys. Lett. 86 (2005) 24210; Physica B 369 (2005) 76; cond-mat/0607577; cond-mat/0608085; cond-mat/0609033).

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