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Micro X-Ray Diffraction Study of VO_2 Films – Separation between Metal-Insulator Transition and Structural Phase Transition KIM HYUN-TAK, KIM BOUNG-JUN, ETRI in Korea, LEE YONG WOOK, ETRI in Korea, YUN SUN JIN, LIM JUNG-WOOK, ETRI in Korea, SHIN TAE-JU, POSTEC, YOUN HWA-SICK, POSTECH — It has been well-known that VO_2 undergoes both a structural phase transition (SPT) from monoclinic (insulator phase) to tetragonal (metal phase) and a discontinuous first-order metal-insulator transition (MIT) (Jump) near 68^oC. When the MIT and the SPT occurs simultaneously, the MIT can be regarded as the Peierls transition. When both take place separately, the MIT can be interpreted as the Mott transition. Peierls transiton and Mott transition in VO_2 remain controversial. We have investigated a relation of the MIT and the SPT which are simultaneously measured by I-V measurement and synchrotron micro X-ray of the 1B2 line in Pohang accelerator Lab., respectively. A used sample is a VO_2-based two terminal device. The result shows that the MIT and the SPT does not occur simultaneously. (References on the MIT: New J. Phys. 6 (1994) 52 (http://www.njp.org), Appl. Phys. Lett. 86 (2005) 242101, Physica B 369 (2005) 76, Phy. Rev. Lett. 97 (2006) 266401, Appl. Phys. Lett. 90 (2007) 023515).

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