Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Mott transition in vanadium dioxide (VO_2) observed by infrared spectroscopy and nano-imaging[1] M.M. QAZILBASH, G.O. ANDREEV, D.N. BASOV, P.-C. HO, M.B. MAPLE, Physics Department, University of California - San Diego, M. BREHM, F. KEILMANN, Abt. Molekulare Strukturbiologie, Max-Planck-Institut fur Biochemie and Center for NanoScience, A. V. BALATSKY, Theoretical Division and Center for Integrated Nanotechnologies, Los Alamos National Laboratory, BYUNG-GYU CHAE, BONG-JUN KIM, SUN JIN YUN, HYUN-TAK KIM, IT Convergence And Components Lab, ETRI, Daejeon, Korea — The driving mechanism for the temperature-induced insulator-to- metal transition (IMT) in vanadium dioxide (VO_2) has been debated for the past five decades. Central to this debate is the relative importance of electron-electron correlations and charge-ordering to the IMT. We report near-field infrared images of VO_2 films that directly show the percolative IMT. In combination with far-field infrared spectroscopy, the new data reveal the Mott transition with divergent optical mass in the metallic puddles that emerge at the onset of the IMT.

[1]This work was supported by the US Department of Energy, the DFG Cluster of Excellence Munich-Centre for Advanced Photonics, and the High Risk High Return project in ETRI, Korea.

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Date submitted: 01 Dec 2007 Electronic form version 1.4