Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Mott transition studied by cellular dynamical mean field theory YUZHONG ZHANG, Johann Wolfgang Goethe-Universität, Institut für Theoretische Physik, MASATOSHI IMADA, Department of Applied Physics, School of Engineering, University of Tokyo, CLAUDIUS GROS, ROSER VALENTI, Johann Wolfgang Goethe-Universität, Institut für Theoretische Physik — We study metal-insulator transitions between Mott insulators and metals. The transition mechanism completely different from the original dynamical mean field theory (DMFT) emerges from a cluster extension of it. A consistent picture suggests that the quasiparticle weight Z remains nonzero through metals and suddenly jumps to zero at the transition, while the gap opens continuously in the insulators. This is in contrast with the original DMFT, where Z continuously vanishes but the gap opens discontinuously. The present results arising from electron differentiation in momentum space agree with recent puzzling bulk-sensitive experiments on $CaVO_3$ and $SrVO_3$. Details of the mechanism of Mott transition is studied through doublon-doublon, doublon-holon and spin-spin dynamical susceptibilities.

Yuzhong Zhang
Johann Wolfgang Goethe-Universität, Institut für Theoretische Physik

Date submitted: 02 Dec 2007 Electronic form version 1.4