## 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 metalinsulator 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 CaVO3 and SrVO3. Details of the mechanism of Mott transition is studied through doublon-doublon, doublon-holon and spin-spin dynamical susceptibilities.

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