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**Fermi surface topology in the proximity to the Mott insulator**  
YOUHEI YAMAJI, University of Tokyo, MASATOSHI IMADA — Since the discovery of cuprate superconductors, how its low energy electronic excitations evolve with doping has attracted much attention. The normal metallic state offers a typical example of strongly correlated metallic state. Recent experiments suggest the existence of the  $k$ -dependent renormalized quasiparticle [1], or more drastic reconstruction of the Fermi surface [2]. Numerical theories on the two-dimensional Hubbard model also predict the reconstruction of the Fermi surface [3]. We propose a scenario for the Fermi surface reconstruction in the proximity to the Mott insulator based on the simple slave-boson mean-field theory [4] including charge fluctuations [5]. The key idea is the emergence of new fermionic excitations consisting of charge bosons and low energy coherent electrons, and occurrence of topological changes in the Fermi surface. We also discuss relation between the topological changes and superconductivities. [1] As a review, A. Damascelli, Z. Hussain, and Z.-X. Shen, *Rev. Mod. Phys.* 75, 473 (2003). [2] J. Meng, et al., arXiv: 0906.2682v1. [3] For example, T. D. Stanescu and G. Kotliar, *Phys. Rev. B* 74, 125110 (2006). [4] G. Kotliar, and A. E. Ruckenstein: *Phys. Rev. Lett.* 57, 1362 (1987). [5] R. Raimondi, and C. Castellani; *Phys. Rev. B* 48, 11453 (1993).

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