

Abstract Submitted  
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**Slave-boson approach to the  $t$ - $t'$ - $t''$ - $U$  model applied to electron-doped cuprates** QINGSHAN YUAN, FENG YUAN, CHIN-SEN TING, TCSAM, University of Houston, Houston, TX 77204 — By applying Hartree-Fock (HF) mean-field theory to the  $t$ - $t'$ - $t''$ - $U$  model, Kusko *et al.* have studied the Fermi surface evolution with doping in the antiferromagnetic (AF) phase for electron-doped cuprates. Although they reached consistent results with ARPES data, a doping-dependent effective  $U$  was adopted, specifically,  $U$  drops from  $6t$  at  $x = 0$  to  $3t$  at  $x = 0.15$ . The strong doping dependence of  $U$  and its small value at  $x = 0.15$  are both in disagreement with the analysis on the optical conductivity [A. J. Millis *et al.*, cond-mat/0411172]. In view that the HF theory often overestimates the AF order, we re-study the model analytically by Kotliar-Ruckenstein slave-boson approach which improves the consideration of fluctuations. A quicker decreasing of the staggered magnetization (and AF gap) with increasing doping than in HF theory is obtained, thus the ARPES results are possibly reproduced even under a doping-independent constant  $U$ . We have further considered superconductivity and its interplay with antiferromagnetism by introducing an attractive intersite  $V$ .

Qingshan Yuan  
TCSAM, University of Houston

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