Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

**Theory of magic dopings in high Tc superconductors**

HANDONG CHEN, Stanford University, SHOU-CHENG ZHANG, Stanford University — Based on an effective bosonic model, we predict checkerboard-type ordering of the Cooper pairs at magic rational doping fractions \((2m + 1)/2^n\), where \(m\) and \(n\) are integers. At the magic doping fraction \(x = (2m + 1)/2^n\), the charge unit-cell is \(2^{(n+1)/2}a \times 2^{(n+1)/2}a\), pointing along the original CuO bond direction when \(n\) is odd, and along the diagonal direction when \(n\) is even. It is generally expected that the charge ordering tendencies are stronger at higher levels of the hierarchy, with smaller \(n\). Recently, a tendency towards charge ordering at particular rational hole doping fractions, 1/16, 3/32, 1/8, and 3/16, is reported in transport measurements of \(La_{2-x}Sr_xCuO_4\) samples[1]. This observation is most consistent with our predicted hierarchy of charge ordering of hole-pairs.

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Date submitted: 01 Dec 2004

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