

Abstract Submitted
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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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