Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Sorting Category: 05. (T)

Hidden D-Wave Checkerboard Order in Cuprates

JIANGPING HU, Purdue University, KANGJUN SEO, Purdue University — We propose a new hidden order, D-wave checkerboard order, to explain the local charge checkerboard ordering observed in STM studies of the High Tc superconductors. We show that even a weak D-wave checkerboard order can have a strong effect on the STM spectrum in superconducting states and can nicely explain experimental observations. The D-wave checkerboard order also generates a Fermi arc with little dispersion around nodal points, which are consistent with results from angle resolved photoemission spectroscopy measurements. Therefore, the D-wave checkerboard order can naturally connect the pseudo-gap physics with the checkerboard structure featured in STM measurements.

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[X] Prefer Oral Session
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Date submitted: 30 Nov 2005 Electronic form version 1.4