

Abstract Submitted  
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**The duality of the density orderings in the high temperature superconductor** KANGJUN SEO, JIANGPING HU, Purdue University, HAN-DONG CHEN, UIUC — We study a d-wave superconductor with possible orders in both the particle-particle and the particle-hole channels using the Bogoliubov-deGennes technique. In the superconducting phase, a duality exists in the particle-particle and particle-hole ordering channels. A small pair density localization generates the d-wave checkerboard density order(DWCB) in the particle-hole channel and the extended s-wave density order(PDW) in the particle-particle channel. The mixed state of DSC with DWCB and PDW with  $4a \times 4a$  periodicity can explain the checkerboard modulation observed in FT-STS from STM as well as the characteristic features such as non-dispersive Fermi arc in the pseudogap state.

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