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**Spin and Charge Excitations in Checkerboards based on a Superstructure** DAVID K. CAMPBELL, DAOXIN YAO, Departments of Physics and Electrical and Computer Engineering, Boston University, ERICA W. CARLSON, Department of Physics, Purdue University — Checkerboard patterns have been proposed to explain the real space structure observed in STM experiments on BSCCO and Na-CCOC. However, simple checkerboard patterns always give incommensurate (IC) spin peaks rotated 45 degrees from the direction of the charge IC peaks, contrary to what is seen in neutron scattering. [1] Here, we study a more complicated checkerboard pattern which can resolve the low frequency inconsistency. Using spin wave theory, we explore the finite frequency response of this superstructure and find that the high energy response is inconsistent with neutron scattering results. In particular, there is no spin resonance peak.

[1] D.X.Yao, E.W. Carlson and D.K.Campbell, Phys. Rev. B 73, 224525 (2006)

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