Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Reconciling Neutron and STM Results for Charge Order in Hole-Doped Cuprates ROBERT MARKIEWICZ, Northeastern University, Boston — Incommensurate elastic or inelastic magnetic neutron scattering in the cuprates has often been interpreted in terms of *one-dimensional stripe* arrays, either static or dynamic. Recent experiments in $La_{2-x}Ba_xCuO_4$ suggest that the resonance mode phenomenon may also be stripe related[1]. On the other hand, while recent STM studies in $Bi_2Sr_2CaCu_2O_{8+\delta}$ (Bi2212) and $Ca_{2-x}Na_xCuO_2Cl_2$ have found clear evidence of charge order, it is in terms of *checkerboards*, not stripes[2]. Intriguingly, both stripes and checkerboards have the same approximate $4a$ periodicity. There is a second puzzling feature of the STM data: there is no sign of bilayer splitting in the Fermi surface reconstructed from the STM quasiparticle interference effect. This may be related to the smearing out of the bilayer splitting in underdoped Bi2212. I propose that both anomalies have the same origin: crossed stripes in alternate layers. Model calculations will be presented. 1: J.M. Tranquada, *et al.*, Nature **429**, 534 (2004). 2: T. Hanaguri, *et al.*, Nature **430**, 1001 (2004).

Robert Markiewicz
Northeastern University, Boston

Date submitted: 29 Nov 2004 Electronic form version 1.4