Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Theory of spin gaps in the dimerized quarter-filled two-leg rectangular ladder[1] YONGGUO YAN, SUMIT MAZUMDAR , University of Arizona — Despite the extensive work on even-leg spin-ladders and 1/2- filled band electron-ladders [2] , little is known currently about commensurate non-1/2-filled band electron ladders. We report density-matrix renormalization group calculations of spin gaps in the 1/4-filled band correlated two-leg rectangular ladder with dimerization along the legs of the ladder. In contrast to the uniform ladder, spin gaps in the dimerized ladder can be significant. Very large spin gaps, as are found experimentally in quarter-filled band organic charge-transfer solids with coupled pairs of quasi-one-dimensional stacks [3], however, occur within the model only for large leg dimerization and electron hopping along the rungs that are nearly equal to the hopping along the legs.

[1]Supported by NSF-DMR-0406604
[2]E. Dagotto and T.M. Rice, Science **271**, 618 (1996).
[3]E. Ribera et al., Chem. Eur. J. 5, 2025 (1999).

Yongguo Yan
University of Arizona

Date submitted: 29 Nov 2005 Electronic form version 1.4