Abstract Submitted
for the APR12 Meeting of
The American Physical Society

Fermion bag solutions to some unsolved sign problems[1] ANYI LI, Institute for Nuclear Theory, University of Washington, SHAILESH CHANDRASEKHARAN, Department of Physics, Duke University — Some interesting lattice four-fermion models containing N flavors of staggered fermions with Z2 and U(1) chiral symmetries suffer from sign problems in the auxiliary field approach. Earlier calculations have either ignored these sign problems or have circumvented them by adding conjugate fermion fields which changes the model. In this talk we show that the recently proposed fermion bag approach solves these sign problems. The basic idea of the new approach is to collect unpaired fermionic degrees of freedom inside a fermion bag. A resummation of all fermion world lines inside the bag is then sufficient to solve the sign problems. The fermion bag approach provides new opportunities to solve in these "unsolved" four-fermion models in the chiral limit efficiently.

[1]This work was supported in part by the DoE grants DE-FG02-05ER41368 and DE-FG02-00ER41132

Anyi Li
Institute for Nuclear Theory, University of Washington

Date submitted: 06 Jan 2012 Electronic form version 1.4