

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**Correlation effects of one band hubbard model beyond the Gutzwiller Approximation** JUN LIU, YONGXIN YAO, CAI-ZHUANG WANG, KAI-MING HO, Iowa State University and Ames Lab — A novel scheme is introduced to go beyond the Gutzwiller approximation (GA). Starting from the scheme, we can see how the standard GA is recovered by relaxing physical constraints step by step. This not only adds to validity of the current scheme, but provides new insights into understanding the GA. Performance of the scheme on several testing cases is superior to the standard GA. We studied the one band Hubbard model in one, two and three dimensions to revisit relevant conclusions made under the GA as well as the slave boson formalism.

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Date submitted: 11 Nov 2011

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