Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

**Search for ferromagnetism in a generalized Hubbard model with disorder** ERIK NIELSEN, R.N. BHATT, Dept. of Electrical Engineering, Princeton University — While the Hubbard model on a hypercubic lattice in two and three dimensions is believed to have a ferromagnetic phase away from half filling, its extent and precise location has remained controversial. With the introduction of positional disorder, a random singlet/valence-bond glass state is stabilized at half filling over the conventional antiferromagnetic phase, which could lead to a considerable reduction in the regime of ferromagnetism. In this study, we have used a variety of numerical techniques, including exact diagonalization of small systems and numerical mean field methods to search for the possibility of ferromagnetism in a generalized Hubbard model with and without positional disorder, aimed at the system of hydrogenic centers in semiconductors. We will present our results showing the effects of positional disorder, of electron-hole asymmetry, and other properties applicable to real experimental systems of doped semiconductors. The possibility of setting up a renormalization scheme as for the half-filled case will be discussed.

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Date submitted: 25 Nov 2005 Electronic form version 1.4