

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Static vacancies in a 2D Heisenberg model with nearest and second-nearest exchange CHEN FANG, Purdue University, BAO XU, Institute of Physics, Chinese Academy of Sciences, JIANGPING HU, Purdue University, WUMING LIU, Institute of Physics, Chinese Academy of Sciences, STEVEN KIVELSON, Stanford University — We studied the effect of vacancies on the magnetic ordering of the frustrated J_1 - J_2 Heisenberg model on a square lattice. Treating the dopants as randomly distributed 'empty sites', it is found that the system indeed undergoes a quantum phase transition into another phase at a certain doping concentration. The change in the local magnetic structure (e.g., the length of the local moments) around the dopants is also investigated and related features are proposed to be probed by experiments. A few connections between our results and iron-based superconductors will be discussed.

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Date submitted: 20 Nov 2009

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