Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Quantum Griffiths effects in itinerant Heisenberg magnets
THOMAS VOJTA, University of Missouri-Rolla, JOERG SCHMALIAN, Iowa State University and Ames Laboratory — We study the influence of quenched disorder on quantum phase transitions in itinerant magnets with Heisenberg spin symmetry, paying particular attention to rare disorder fluctuations. In contrast to the Ising case where overdamping suppresses the tunneling of rare regions, the XY- and Heisenberg system displays strong power-law quantum Griffiths singularities in the vicinity of the quantum critical point. We discuss these phenomena based on general scaling arguments, and we illustrate them by an explicit calculation for O(N) spin symmetry in the large-N limit. We also discuss broad implications for the classification of quantum phase transitions in the presence of quenched disorder.

Thomas Vojta
University of Missouri-Rolla

Date submitted: 01 Dec 2004 Electronic form version 1.4