Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

High temperature series expansion and the exact solution study of the 1/5 depleted square lattice Ising model[1] SIMEON HANKS, TRINANJAN DATTA, Augusta State University , JAAN OITMAA, The University of New South Wales — The critical behavior of the 1/5 depleted square-lattice Ising model with nearest neighbor ferromagnetic interaction has been investigated by means of both a high-temperature series expansion and an exact solution. The critical point in the coupling constant has been accurately determined with a series expansion up to order eighteen in the high temperature expansion parameter. For the exact solution we use a set of decoration transformations to recast the original model in terms of a set of nearest neighbor, next-nearest neighbor, and four spin interaction Ising model. This is followed by a transformation to a staggered 8-vertex model. As the vertex weights satisfy the free-fermion condition the free energy and critical point are obtainable by standard methods.

[1]Cottrell Research Corporation Grant No 20073

Simeon Hanks
Augusta State University

Date submitted: 07 Nov 2012 Electronic form version 1.4