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PHYC6261 Winter 2015/16

(grad) Statistical Mechanics I

assignment #3

[Due Monday March 7.]

1. Sethna 9.5 Landau MFT [2 marks]

2. Sethna 9.4 Domain Wall energy [2 marks]

3. MFT series expansion [numerical, 2 marks] Expand the Bragg-Williams free energy for an Ising model in powers of m to n terms. Call this G_n, and numerically extract the minimum $m_n(T)$. Compare this to the exact result G, which gives the Curie-Weiss self-consistent solution for $m(T)$. As a function of T/T_C, plot m_n and m. Also plot how many terms you need to get them to agree within 1%. Discuss.

4. PB 3.9 MFT latent heat [2 marks]

5. PB 4.1 MFT solid-solid solutions [2 marks]