
Exercises

12.1 Ising self-similarity.¹ ①

Start up the Ising model (computer exercises portion of the book web site [129]). Run a large system at zero external field and $T = T_c = 2/\log(1 + \sqrt{2}) \approx 2.26919$. Set the refresh rate low enough that graphics is not the bottle-neck, and

run for at least a few hundred sweeps to equilibrate. You should see a fairly self-similar structure, with fractal-looking up-spin clusters inside larger down-spin structures inside ...

Can you find a nested chain of three clusters? Four?

¹From *Statistical Mechanics: Entropy, Order Parameters, and Complexity* by James P. Sethna, copyright Oxford University Press, 2007, page 282. A pdf of the text is available at pages.physics.cornell.edu/sethna/StatMech/ (select the picture of the text). Hyperlinks from this exercise into the text will work if the latter PDF is downloaded into the same directory/folder as this PDF.