Fys4150
Project 4 Figures and stuff

Peter Killingstad and Karl Jacobsen

https://github.com/kaaja/fys4150

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4b

mcs	Eavg	absMavg	Cv	chi
100	-2.000000	1.000000	0.000000	0.000000
1000	-1.994000	0.998000	0.047856	0.005984
10000	-1.993800	0.997900	0.049446	0.006382
100000	-1.995360	0.998450	0.037034	0.004650
1000000	-1.995910	0.998620	0.032653	0.004182
10000000	-1.995949	0.998646	0.032349	0.004064
100000000	-1.995968	0.998656	0.032195	0.004024
1000000000	-1.995976	0.998659	0.032133	0.004016
1410065408	-1.995978	0.998660	0.032114	0.004011

Table 1: Estimated quantitites

mcs	Eavg	absMavg	Cv	chi
100	0.201300	0.134106	-100.000000	-100.000000
1000	-0.099304	-0.066162	49.166215	49.199418
10000	-0.109324	-0.076175	54.122962	59.131750
100000	-0.031167	-0.021102	15.433885	15.948442
1000000	-0.003612	-0.004079	1.779036	4.279582
10000000	-0.001658	-0.001435	0.830445	1.319746
100000000	-0.000696	-0.000456	0.350614	0.335773
1000000000	-0.000320	-0.000187	0.156479	0.120349
1410065408	-0.000200	-0.000077	0.097802	0.016475

Table 2: Percentage deviations from analytical results

1 4c

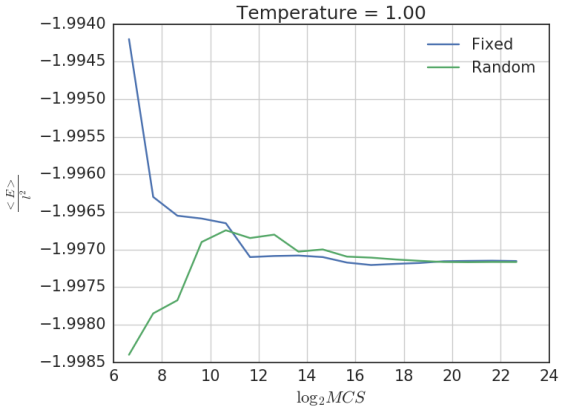

Figure 1: Expected Energy divided by L^2. $T = 1.0$.
Equilibrium reached after 2^{20} *Monte Carlo cycles.*

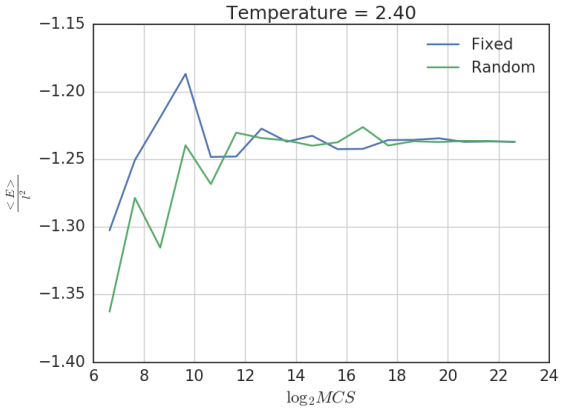

Figure 2: Expected Energy divided by L^2. $T = 2.4$.
Equilibrium reached at same point as for $T = 1$.

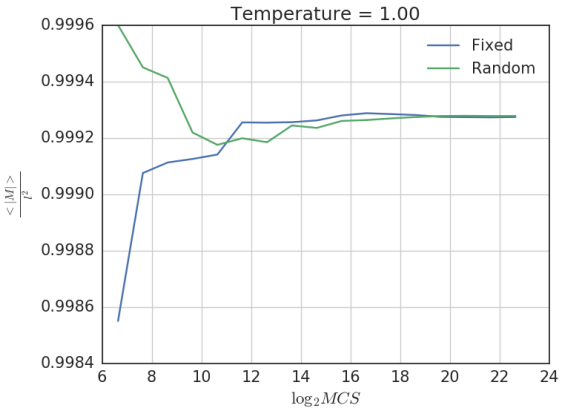

Figure 3: Expected absolute magnetic momentum divided by L^2. $T = 1.0$.
Equilibrium reached at same point as for the energy.

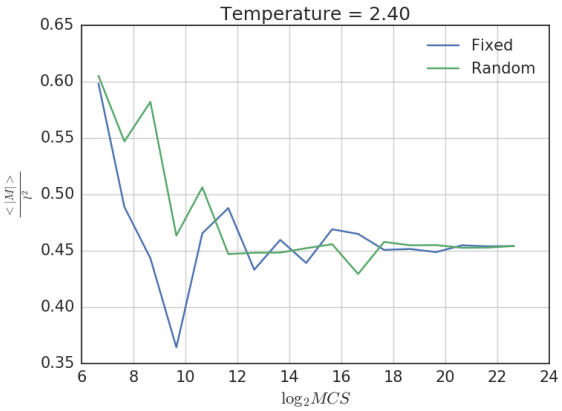

Figure 4: Expected absolute magnetic momentum divided by L^2. $T = 2.4$.
Equilibrium reached at same point as for the others.

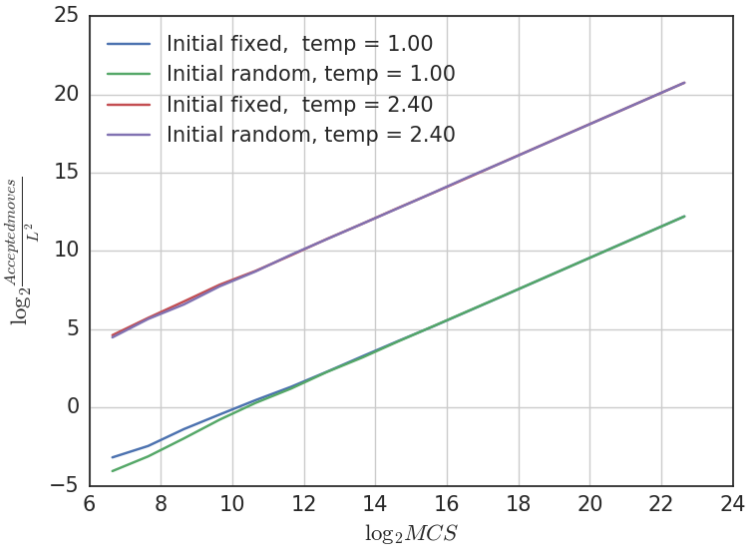

Figure 5: Accepted moved divided by L^2.

2 4d

$\log_2 MCs$	T	μ_E/L^2	$< E > /L^2$	$(\frac{\mu_E/L^2}{<E>/L^2} - 1) \cdot 100$	σ_E^2/L^2	$\frac{<E^2>-<E>^2}{L^2}$	$(\frac{\sigma_E/L^2}{1/L^2(<E^2>-<E>^2)} - 1) \cdot 100$	$< \lvert M \rvert > /L^2$	$\frac{<\lvert M \rvert^2>/L^2-<\lvert M \rvert>^2}{L^2}$	Cv/L^2	χ/L^2
11.0	1.0	-1.997061	-1.99706	0.000002	0.023692	0.023692	-0.000002	0.999246	0.001613	0.023692	0.001613
11.0	2.4	-1.255015	-1.99706	-37.156904	9.419375	0.023692	39657.141668	0.999246	0.001613	0.023692	0.001613

Table 3: Statistics. Fixed initial config.

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$\log_2 MCs$	T	μ_E/L^2	$< E > /L^2$	$(\frac{\mu_E/L^2}{<E>/L^2} - 1) \cdot 100$	σ_E^2/L^2	$\frac{<E^2>-<E>^2}{L^2}$	$(\frac{\sigma_E/L^2}{1/L^2(<E^2>-<E>^2)} - 1) \cdot 100$	$< \lvert M \rvert > /L^2$	$\frac{<\lvert M \rvert^2>/L^2-<\lvert M \rvert>^2}{L^2}$	Cv/L^2	χ/L^2
11.0	1.0	-1.939932	-1.939932	0.000002	6.746561	6.746561	4.565043e-07	0.879219	26.793008	6.746561	26.793008
11.0	2.4	-1.212202	-1.939932	-37.513150	8.755345	6.746561	2.977495e+01	0.879219	26.793008	6.746561	26.793008

Table 4: Statistics. Random initial config.

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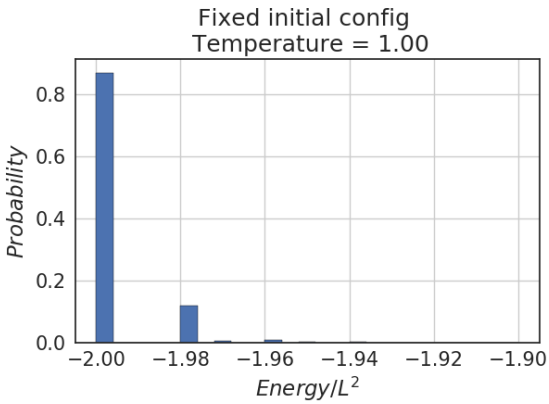

Figure 6: Probability distribution. Fixed intital $T = 1$.

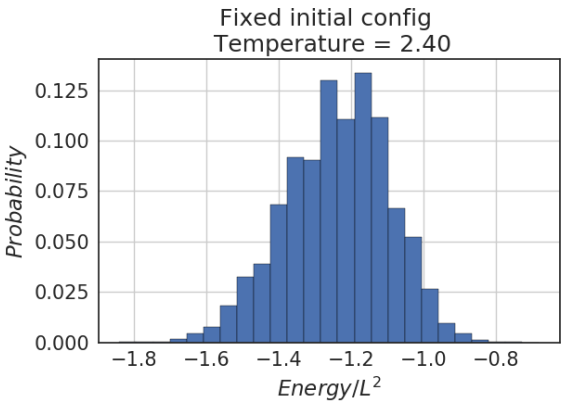

Figure 7: Probability distribution. Fixed intital $T = 2.4$..

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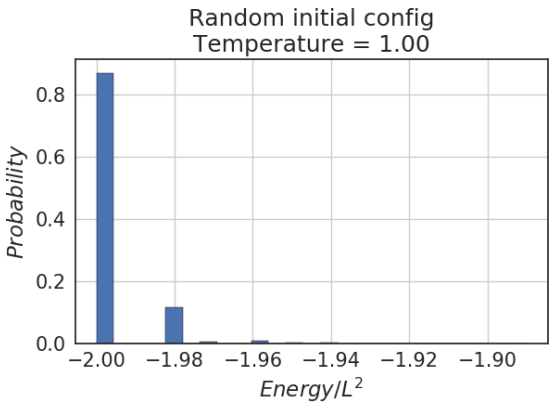

Figure 8: Probability distribution. Random intital $T = 1$.

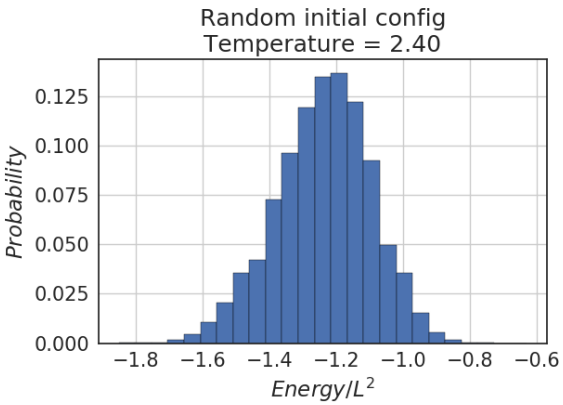

Figure 9: Probability distribution. Random intital $T = 2.4$.

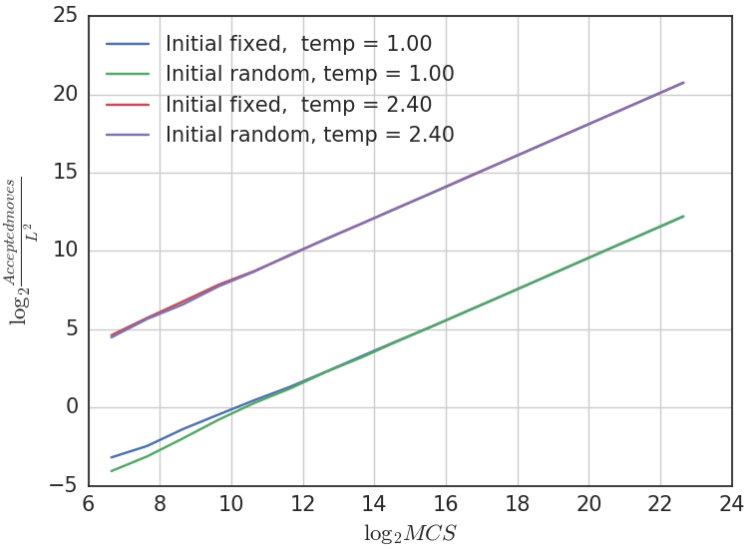

Figure 10: Accepted moved divided by L^2.

3 4e

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Spin combos	$T_c^{Estimate}(L=\infty)$	$(\frac{T_c^{Estimate}(L=\infty)}{T_{c,exact}} - 1) \cdot 100$
$[40, 60]$	2.275	0.256245523473
$[40, 60, 100]$	2.225	-1.94718844408
$[40, 60, 100, 140]$	2.2125	-2.49804693596

Table 5: something

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