$iter\_sum_{0,k} = 0$;   # for $(0,0)$ and $(2\pi/L, 0)$
normalization_factor $= 0$;
for *every lattice size* L **do**
    for *every disorder* e **do**
        initialize interaction configuration;
        initialize spin configuration;
        for *warm up period* **do**
            update lattice;
        end
        for *sample period* **do**
            update lattice;
            iter_sum += magnetic susceptibility for current spin config;
            normalization_factor $+ = 1$;
        end
    end
end
ζ calculation from iter_sums;

Basically only changed expectation value estimator to: $\frac{1}{norm\_fac}\sum_{u,e}\hat{\chi}_{u,e} \rightarrow \langle\hat{\chi}\rangle = \sum_e Pr(e)\sum_s \frac{e^{-\beta H_e(s)}}{Z_e}\hat{\chi}(s)$

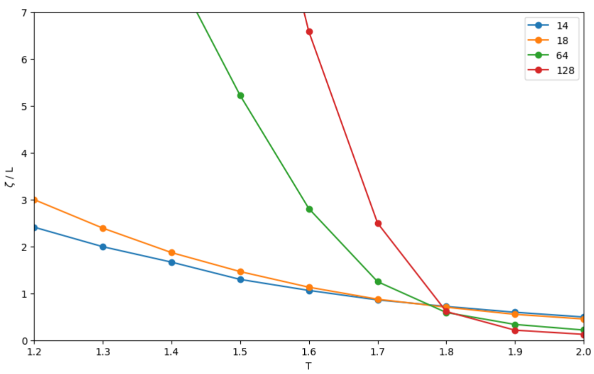

Figure 1: $p = 6\%$ plain mean, $up = 1$, $ne = 1000$, $ni = 1000$, $nw = 10000$

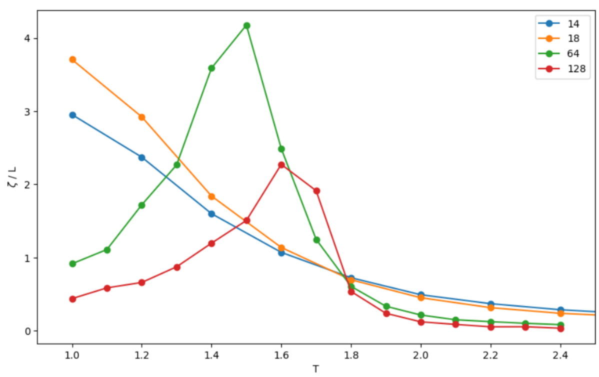

Figure 2: $p = 6\%$ included Boltzmann factor, $up = 0$, $ne = 1000$, $ni = 1000$, $nw = 50000(200000)$

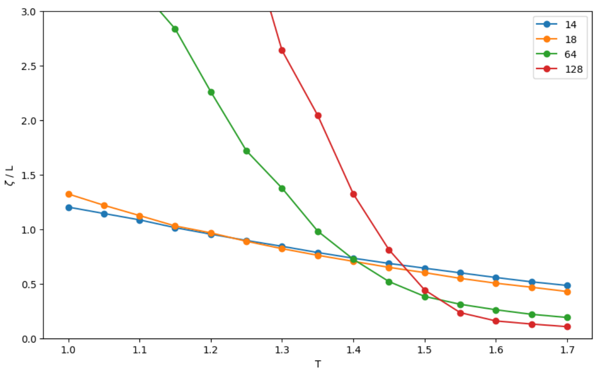

Figure 3: $p = 10.0\%$ plain mean, $up = 1$, $ne = 10000$, $ni = 5000$, $nw = 5000$

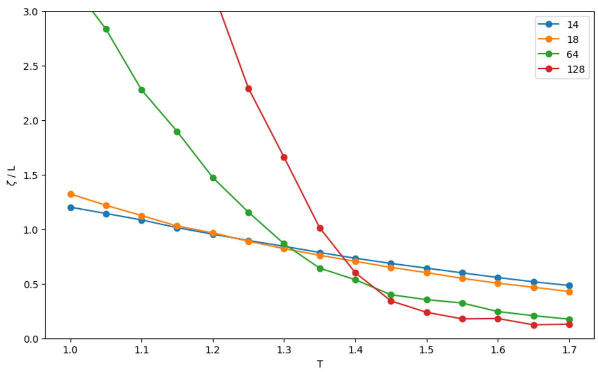

Figure 4: $p = 10.0\%$ plain mean, $up = 1$, $ne = 1000$, $ni = 1000$, $nw = 50000$

For larger lattice sizes seems like longer equilibration phases are still needed to sample from correct regime. Estimation of convergence by lograithmic binning or just remember previous estimate and compute deviation for some sparse steps.