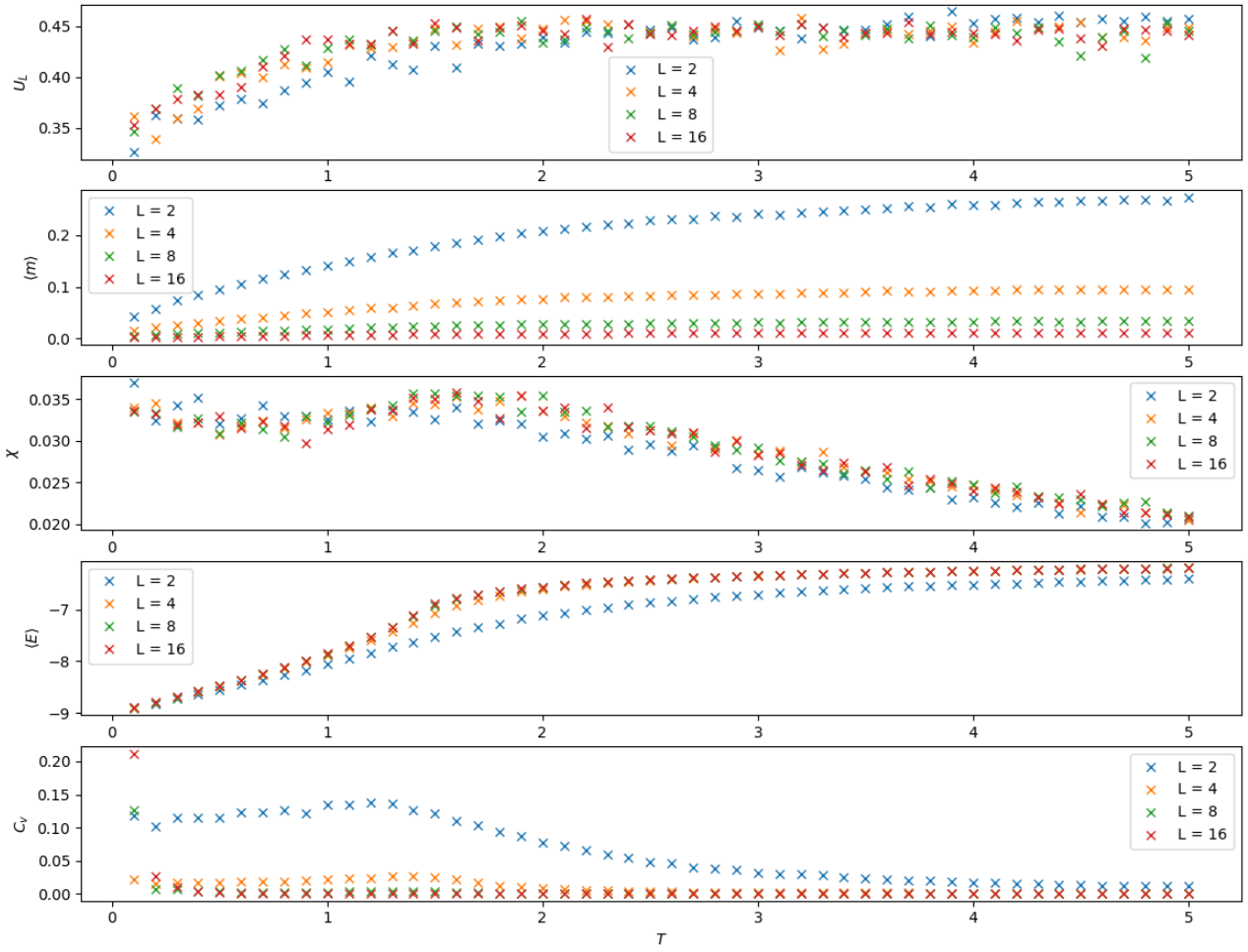
CSP Ex05

Task1: Compile with “make mr2t2” and run “source run_task1.sh”

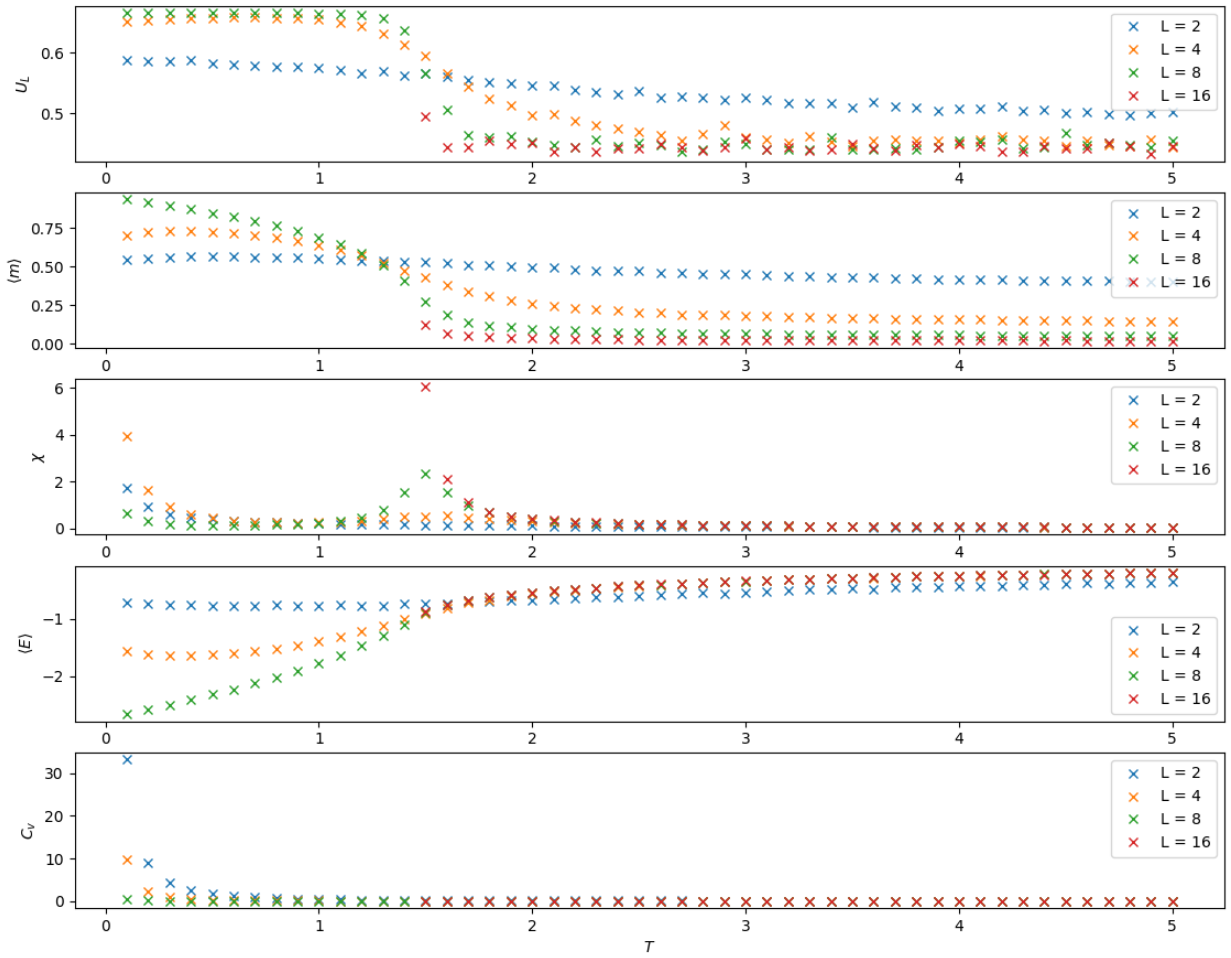
I tried to find my mistake, but unfortunately Idk why it looks so wrong. Maybe the given dE formula from the exercise session is not right (Probably misunderstood it). All of the plots kinda look wrong. Except the <E> kinda looks right, but its y-axis don’t look right. Still, I am happy it worked out easily with the extension of my container for 3d spins. I only think some small calculations are wrong.



Task2: Compile with “make wolff” and run “source run_task2.sh”

Surprisingly Wolff algorithm one was more successful then M(RT)2. I accept all of the outcoming curves (except C_v kinda not right). Btw the bond probability is different from the exercise sheet compared to the one you showed us in the session. I tried both versions and the one on the exercise sheet gave the more consensual curves (see out commented code). Also, calculating the energy is not done in an efficient way, because I did not know how to do it (except implementing a list of all spins which are part of the cluster). I used the primitive method of calculating the total_energy after each move. <H> is in my case <E> in the plot. I

tried running with lattice size L=16, but at very low temps it took forever. It is also interesting to see that L=2 data do not behave really “critically” like they should.



Task3: Compile with “make wolff” and run “source run_task2.sh”

I used the Wolff algo, because it was doing more right measurements than M(RT)2. Look at the first plot of Wolff. The curves meet at around T_c = 1.55. But interestingly for <m> it is more like T_c = 1.4 and for \chi it is T_c = 1.55. Idk why it is shifted for <m>. Still they are all close to the one you showed us from the paper of beta = 0.6969 -> T_c = 1.43.