Computational Physics HW7

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1 Introduction

In this assignment we simulate a small system of particles in a Metropolis gas scenario.

2 Results

2.1 Question 1

Seen below are snapshots of 2 different systems with similar starting configurations, but different initial temperature. The lower energy system would correspond to something akin to a droplet of water. Some molecules have enough energy to escape the system i.e. evaporate, while the high energy system is like that of a gas where every molecule is energetic enough to turn to steam.

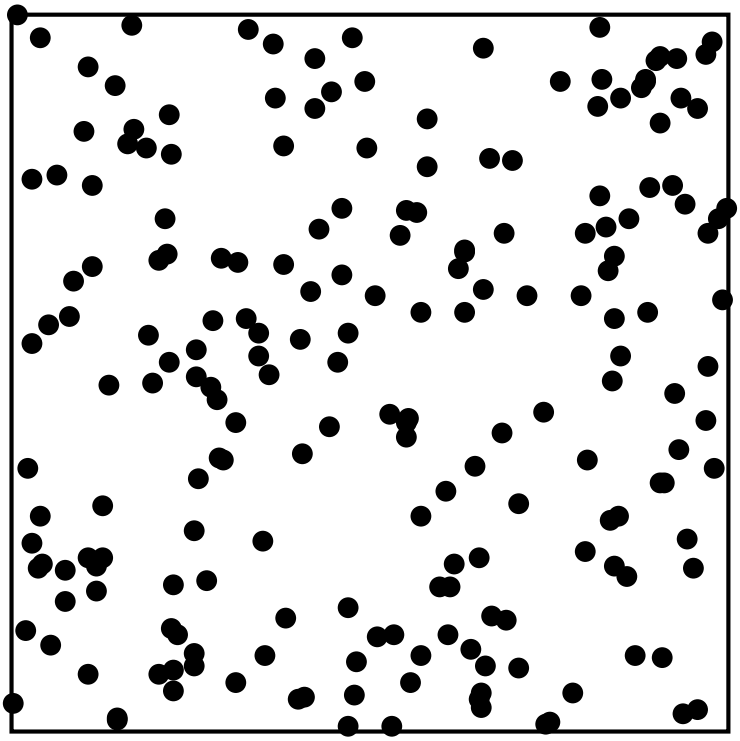

Figure 1: A system of 200 molecules where initially $kT = 5$: The system is almost immediately scattered and thermalized.

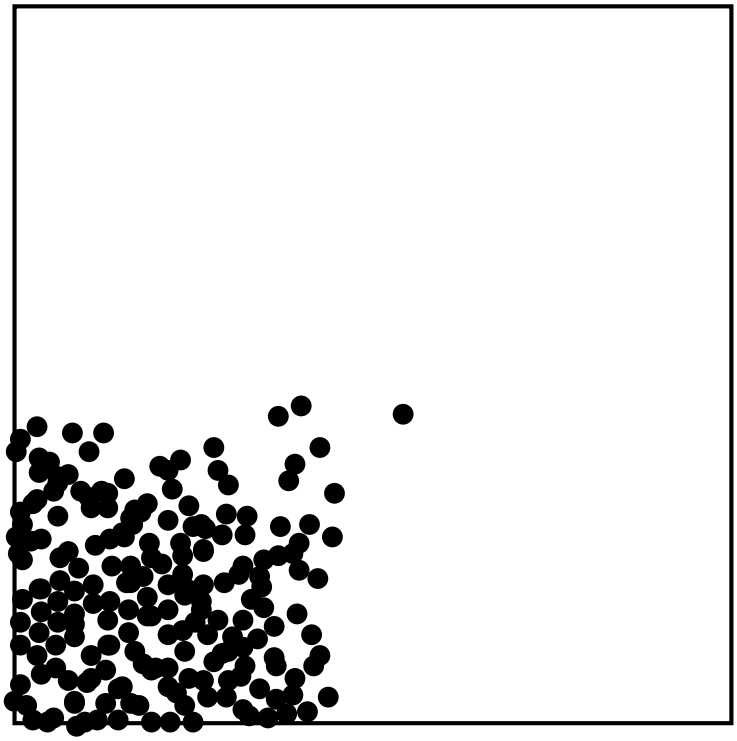

Figure 2: A system of 200 molecules where initially $kT = 0.5$: The system remains condensed into a single block.

For $kT = 5$: $dx = 20$ and $dv = 4$. This system is a high energy gas.
For $kT = 5$: $dx = 0.155$ and $dv = 1.3$. This system is a condensed liquid.

2.2 Question 2

2.3 Question 3

3 Conclusion

Should have started this assignment earlier...