Computational Physics II

Homework 10

Submission: January 28 (Tuesday), 2020

Simulating hard particles in one dimensions with event-driven simulations (10 points)

Consider a system of N particles in one dimension (in length L with periodic boundary condition), interact via instantaneous collision. Write a program for the event-driven algorithm to calculate collision times and update the velocities for the following two cases. (*You can consider the density of particles* $\rho = 0.1$ *and* N *around* 300.). You can consider only the neighboring particles for calculating collision time and partners.

- Measure the kinetic energy versus time for the elastic case ($e = 1$).
- Measure the kinetic energy versus for the inelastic case also ($e = 0.9$). For this case, if possible, mark the crossover from the HCS to ICS.