

Report of results

May 16, 2018

1 Continuous Version

ToDo

2 Lattice Version

So far for the lattice version the influence of the length of the system, the detection radius and absorbing walls on the mean first passage time have been examined. For all simulations the target has been centered and periodic boundary conditions were used except in the case of absorbing walls.

2.1 System length L

To examine the influence of the system length on the mean first passage time the system length has been varied between 10 and 1000 lattice sites. As one can see in figure 1 the minimum of the mean first passage time shifts to higher values of p and therefore more persistent searchers as the system length increases. Figure 2 shows this more clearly and gives reason to assume that the optimal persistency approaches 1 in the limit of huge system sizes.

Furthermore, figure 3 shows different logscale for the optimal persistency to prove that there is no easy mathematical law describing the dependency.

2.2 Detection Radius D

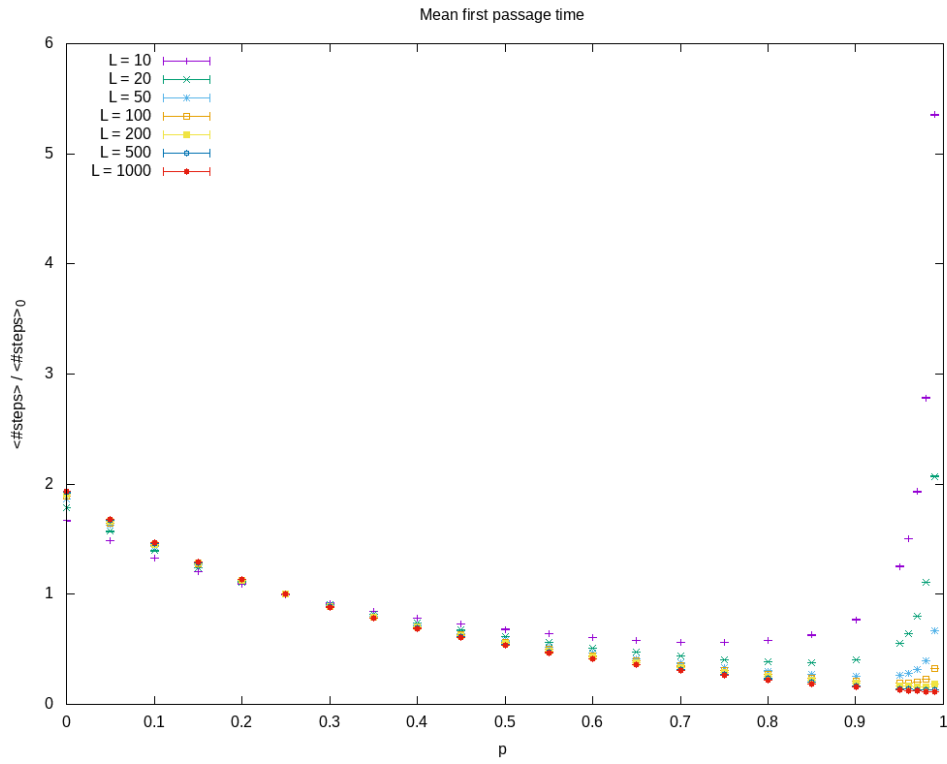


Figure 1: Mean first passage time in dependency of the persistency for different system lengths. Mean first passage time has been rescaled by the mean first passage time for $p = 0.25$ which corresponds to diffusion.

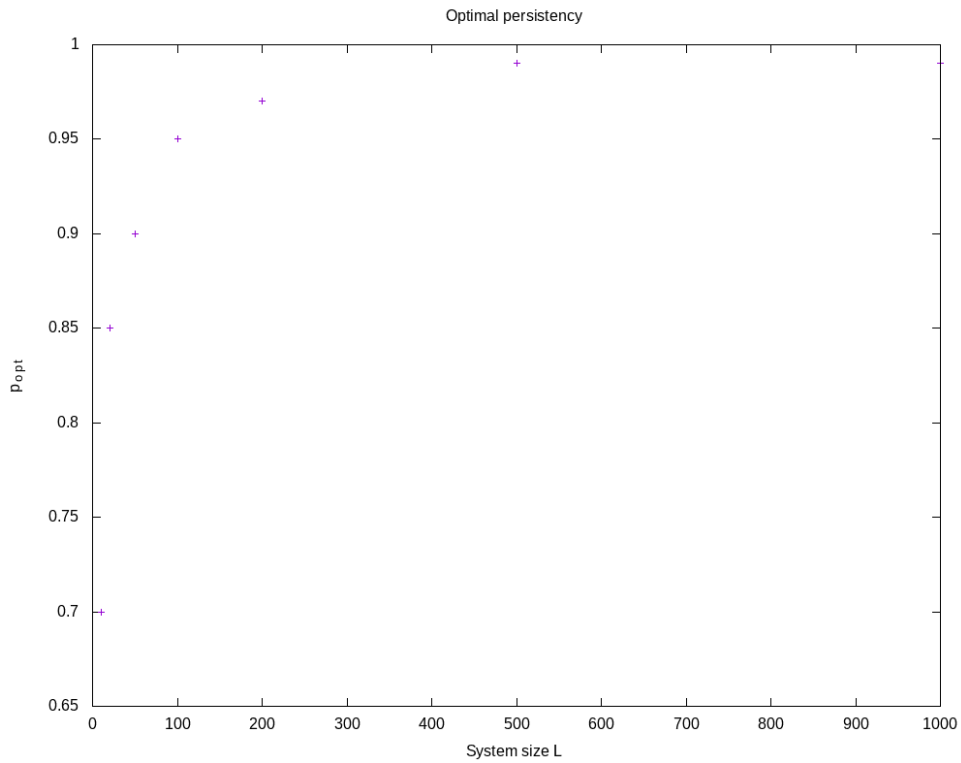


Figure 2: Optimal persistency in dependency of the system length.

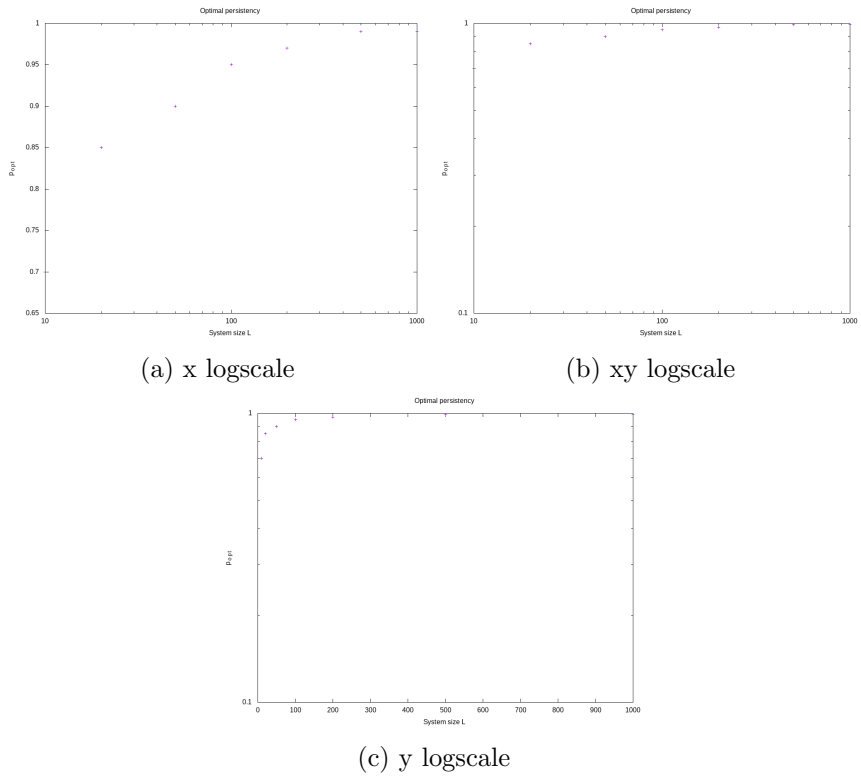


Figure 3: Different logscales for the optimal persistency in dependency of the system length.