

PHYS 325: Computational Physics III

Winter 2023

Exercise 4.3

1. We'll repeat Exercise 4.2, except that we will use some Physics knowledge to ensure that the step we take should go in the direction of reducing the total potential energy:

At step (b), we don't take a random step in two dimensions. Instead, we compute the electric field $\mathbf{E}$ at the location of the chosen charge and take a random step of length uniformly chosen in the range $(0, \delta)$ *in the direction of the field* $\hat{\mathbf{E}}$.

Everything else should be the same as before.

As before, you should find that the charges distribute themselves on the surface of the conductor. Using $N = 1000$ charges, plot the initial and final configurations of the system.