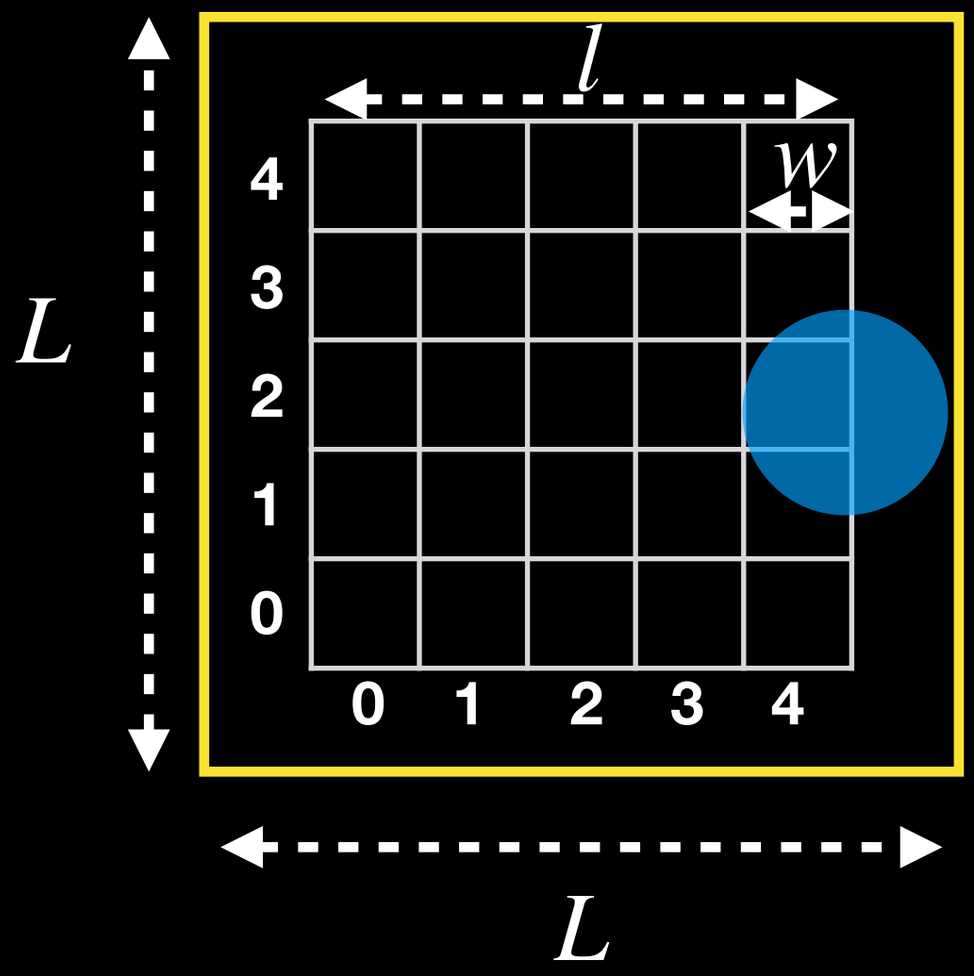
Project 5) Depletion interactions

It is a simple question, with a surprising result: Do the confining walls attract particles? In particular, what is with the corners of the box?

To answer this question, you must create a two-dimensional histogram of the distribution of the particle positions. This means you must discretize the continuous space.



The accessible area must be covered by a 2D grid, i.e. a two-dimensional array $H[X_i, Y_i]$.

The accessible area is $l \times l$, with $l = L - 2R$ (note the gap of the radius between the wall and the histogram).

If the dimension of the array is $N \times N$, then the width of one bin is $w = l/N$.

A particle position (x_i, y_i) is associated to the indices $X_i = (int)\,(x_i/w)$ and $Y_i = (int)\,(y_i/w)$ of the two-dimensional histogram.

Does the result depend on the number of particles ????
What happens, if you put a hand full of big particles in a bath of small particles? Are the big particles attracting each other?

Note: It is not necessary, that one and the same code does everything. You can write several codes, which do one specific measurement.