

TutR1.2__bimolecular__polardistribute

April 30, 2024

1 Tutorial: RDME- Bimolecular Reaction __ Polar Distribution

The purpose of this tutorial is to get users familiar with the `lm.jLM` functions and show the diffusion phenomenon by comparing the results with the first tutorial [TutR1.1_bimolecular__uni](#).

For comparison, all the parameter are the same, except how we place the particle A and B.

ps: For all the functions used here, you can check the [jLM api docs](#) for details.

1.1 0.Environment Check

if you didn't install the environments in docker or any container, we suggest you do it through anaconda/miniconda.

basically, you need to install the dependencies

```
conda env create -f rdme_env.yml
```

Then import jLM package.

```
[1]: import jLM                                     # Set up the Jupyter environment
      from jLM.RDME import Sim as RDMESim          # Main simulation class
      from jLM.RegionBuilder import RegionBuilder  # Deal with the spatial geometry
      from lm import IntMpdRdmeSolver              # lm::rdme::IntMpdRdmeSolver

      import numpy as np
```

<IPython.core.display.HTML object>

2 1. Initialization

2.1 1.1 RDME simulation object creation

First step is to create a object that contains all the essential information to start a simulation.

The class we use here is:

```
sim = jLM.RDME.Sim(simulation_name,
                   filename,
                   dimensions,
                   latticeSpacing,
```

```

regionName,
dt=None)

```

- simulation_name is what we call our system;
- filename: the name of the final output trajectory file.(hdf5 format)
- dimensions: the number of lattices in x,y,z dimension. in list [dimx,dimy,dimz], must be divisible by 32.
- latticeSpacing: the actual physical representation of the length of each subvolume cube, unit: meter.
- the Name of the entire sim region, default="external"
- dt: time steps for the RDME simulation, unit: second.

```

[2]: cellvol = 1.0e-15           # L=dm^3
simname = "Bimolecular_System_polar"
filename = "TutR1.2_bimolecular_polardis.lm"
Ldim = [64,64,64]              # Has to be multiples of 32
lattice_spacing = 32e-9        # in m
regionN = "extracellular"
dt = 25e-6                     # in s

```

```

[3]: sim = RDMSim( simname,
                  filename,
                  Ldim,
                  lattice_spacing,
                  regionN,
                  dt)

```

in case you forget, or want to redefine some key parameters in the simulation we define above, you can always call methods to adjust them.

for example, we can change the simulation time step by:

```

[4]: sim.timestep = 50e-6      # in s

```

next we need to define the total simulation time, the time interval to write results to our trajectory for lattice and species, normally we keep them the same.

Be careful, the unit for Interval is "time steps", and should be an integer.

The actual physical time for interval would be:

$$t = Interval * dt$$

since we define $dt = 50 \times 10^{-6}s$, the actual write interval would be:

$$2000 * 50 \times 10^{-6} = 0.1s$$

```

[5]: sim.simulationTime=30.0    # unit is seconds

sim.latticeWriteInterval= int(2000)    # unit is timesteps, dt
sim.speciesWriteInterval= int(2000)    # unit is timesteps, dt

```

2.2 1.2 Spatial Geometry Initialization

now, we need to add more spatial compartments to our system, for simplicity, our first toy system would only have three spatial regions: + extracellular + cytoplasm + plasm membrane

we want each of them mutually excluded, and if we combine them all together, it should be the entire lattice sites we create:

$$\text{lattice} = \text{extracellular} \cup \text{membrane} \cup \text{cytoplasm}$$

and naturally

$$\emptyset = \text{membrane} \cap \text{cytoplasm}$$

$$\emptyset = \text{membrane} \cap \text{extracellular}$$

$$\emptyset = \text{cytoplasm} \cap \text{extracellular}$$

In order to design the site lattice geometry, we create a `RegionBuilder` object, which reads the lattice dimensions from our simulation object `sim`.

```
[6]: build = RegionBuilder(sim)
```

we create a sphere to represent the cytoplasm with radius=25, center at [32,32,32]

```
[7]: radius = int(np.ceil((cellvol*3/4/np.pi)**(1/3)*0.1/lattice_spacing))
      print(radius)
      cytoplasm = build.ellipsoid(radius = radius, center = [32,32,32])
```

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Then we dilate the cytoplasm, and create a surface with the dilation method, and exclude the cytoplasm to represent our membrane

```
[8]: cytoplasm_dilation = build.dilate(cytoplasm, se = build.se26)
      membrane = cytoplasm_dilation & ~cytoplasm
```

Finally, make sure our extracellular region excludes the cell.

```
[9]: # effectively, cytoplasm_dilation = cytoplasm and membrane
      extracellular = ~cytoplasm_dilation
```

we need our simulation system to compose all the regions together.

```
[10]: cyt = sim.region('cytoplasm')
      mem = sim.region('membrane')
      ext = sim.region('extracellular')

[11]: build.compose(
      (sim.region('extracellular'), extracellular),
      (sim.region('cytoplasm'), cytoplasm),
      (sim.region('membrane'), membrane))
```

wonderful, now we have all the geometric information, we can visualize it in two different ways: stacks and 3D

```
[12]: sim.showRegionStack()
```

```
[12]: <IPython.core.display.HTML object>
```

```
[13]: sim.displayGeometry()
```

```
[13]: <IPython.core.display.HTML object>
```

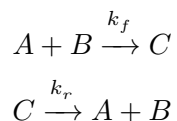
2.3 1.2 Species and diffusion Co. Initialization

For simplicity, we only want our bimolecular reaction take place in cytoplasm and only allow each species to diffuse in cytoplasm.

Our Template will be a reversible reaction as:



However, our software only accept one-way reaction, we need to separate it into two irreversible reactions:



initial condition:

#A = 1000

#B = 1000

#C = 0

```
[14]: spA = sim.species('A')
      spB = sim.species('B')
      spC = sim.species('C')
```

- function references:

`sim.species((str)name, [(str,latex)textPepr, (str)annotation])`

Then you can call the following function to check the relevant info about your species:

```
[15]: sim.showAllSpecies()
```

```
[15]: <IPython.core.display.HTML object>
```

```
[16]: sim.showSpecies('A')
```

```
[16]: <IPython.core.display.HTML object>
```

Now, you may notice all Diffusion rates are undefined, so we are going to **define all the diffusion coefficients** for each species.

```
[17]: sim.transitionRate(None, None, None, sim.diffusionZero) # initialization of the
      ↪diffusion rates to 0
```

define a custom made diffusion coefficient.

```
[18]: sim.diffusionConst('diff1', 1e-14)
```

```
[18]: <jLM.Types.DiffusionConst at 0x7f1fd049c278>
```

set diffusion rate:

```
[19]: sim.transitionRate(sim.species('A'), sim.region('cytoplasm'), sim.
      ↪region('cytoplasm'), sim.dc.diff1)
      # sim.transitionRate(spA, mem, mem, sim.dc.diff1)

      sim.transitionRate(spB, cyt, cyt, sim.dc.diff1)    # use defined diffusion rate
      sim.transitionRate(spC, cyt, cyt, sim.dc.diff1)
```

check the result:

```
[20]: sim.showAllSpecies()
```

```
[20]: <IPython.core.display.HTML object>
```

2.4 1.3 Reactions Initialization

```
[21]: NA = 6.022e23      # molecules/mole
      # kf = sim.rateConst('kf', 1.07e5/(NA*cellvol), 2)
      kf = sim.rateConst('kf', 1.07e5, 2)
      # rate constant for the reaction A + B -> C, second order, /M/s
      kr = sim.rateConst('kr', 0.351, 1)
      # rate constant for the reaction C -> A + B, first order, /s
```

Reactions can be added by the function: `jLM.RDME.Sim.region('region_name').addReaction`

Since we already define the name of the region we want to add reactions, there will be two ways you can add reactions:

```
[22]: sim.region('cytoplasm').addReaction([spA,spB], [spC], sim.rc.kf)
      cyt.addReaction([spC], [spA,spB], kr)
```

```
[22]: <jLM.Types.BuilderRegion at 0x7f1fd31230f0>
```

2.5 1.4 Add particles

Here, in order to see the effects of diffusion, we put 1000 species A at one side, and 1000 species at the other side. Instead of uniform distribution.

```
[23]: # uniformly distribute the species in the cytoplasm
# sim.distributeNumber(spA, cyt, 1000)
# sim.distributeNumber(spB, cyt, 1000)
# sim.distributeNumber(spC, cyt, 0)
# sim.sp.A.placeNumberInto(cyt, 1000)

cyto_cent = [32,32,32]
cyto_left_cent = [32-int(radius/2),32,32]
cyto_right_cent = [32+int(radius/2),32,32]

total_A = 1000
total_B = 1000
total_C = 0

# write a BFS function to place the species in the cytoplasm start from
# cyto_left_cent
def placeNumbersInCyto(sp, x, y, z, n):
    '''place certain amount of species in the cytoplasm, start from x, y, z'''
    neighbor_26 = [[0,0,1],[0,0,-1],[0,1,0],[0,-1,0],
                  [1,0,0],[-1,0,0],[0,1,1],[0,1,-1],
                  [0,-1,1],[0,-1,-1],[1,0,1],[1,0,-1],
                  [-1,0,1],[-1,0,-1],[1,1,0],[1,-1,0],
                  [-1,1,0],[-1,-1,0],[1,1,1],[1,1,-1],
                  [1,-1,1],[1,-1,-1],[-1,1,1],[-1,1,-1],
                  [-1,-1,1],[-1,-1,-1]]

    q = []
    visited = []
    q.append([x,y,z])
    remaining = n
    while len(q) > 0:
        cur = q.pop(0)

        if remaining <= 0:
            break
        visited.append(cur)
        if remaining / 16 >= 1:

            sim.placeNumber(sp=sp, x=cur[0], y=cur[1], z=cur[2], n=16)
            remaining -= 16
        else:
            sim.placeNumber(sp=sp, x=cur[0], y=cur[1], z=cur[2], n=remaining)
            remaining = 0
```

```

        for i in neighbor_26:
            next = [cur[0]+i[0], cur[1]+i[1], cur[2]+i[2]]
            if next not in q and next not in visited and next[0] >= 0 and
↪next[0] < 64 and next[1] >= 0 and next[1] < 64 and next[2] >= 0 and next[2]
↪< 64:
                q.append(next)
            print("successfully placed " + str(n) + " species" + sp.name + " in the
↪cytoplasm.")
            return visited

```

```

[24]: ini_A_reg = placeNumbersInCyto(spA, cyto_left_cent[0], cyto_left_cent[1],
↪cyto_left_cent[2], total_A)
ini_B_reg = placeNumbersInCyto(spB, cyto_right_cent[0], cyto_right_cent[1],
↪cyto_right_cent[2], total_B)

```

successfully placed 1000 speciesA in the cytoplasm.
 successfully placed 1000 speciesB in the cytoplasm.

```

[25]: sim.showAllSpecies()

```

```

[25]: <IPython.core.display.HTML object>

```

3 2 Check the system state

```

[26]: sim

```

```

[26]: <jLM.RDME.Sim at 0x7f1ff5f14f98>

```

now we confirmed it is what we want, we can now proceed to finalize the simulation we create.

```

[27]: sim.finalize()

```

4 3. Run the Simulation

```

[28]: sim.run(solver=IntMpdRdmeSolver(), cudaDevices=[0])

```

```

2024-04-30 11:30:51) Info: Using 32 processor(s) and 1 CUDA device(s) per
process.
2024-04-30 11:30:51) Info: Assigning 1.00 processor(s) and 1.00 CUDA device(s)
per replicate.
2024-04-30 11:30:51) Info: Data output thread running.
2024-04-30 11:30:53) Warning: 267 uses of the particle overflow list in the last
1000 timesteps, performance may be degraded.
2024-04-30 11:30:53) Info: Time is 0.100000000000000
2024-04-30 11:30:53) Info: Lattice write time is 0.100000000000000, in steps is
2000

```

2024-04-30 11:30:53) Info: Next lattice write time is 4000
 2024-04-30 11:30:53) Warning: 11 uses of the particle overflow list in the last 1000 timesteps, performance may be degraded.
 2024-04-30 11:30:54) Info: Time is 0.200000000000000
 2024-04-30 11:30:54) Info: Lattice write time is 0.200000000000000, in steps is 4000
 2024-04-30 11:30:54) Info: Next lattice write time is 6000
 2024-04-30 11:30:55) Info: Time is 0.300000000000000
 2024-04-30 11:30:55) Info: Lattice write time is 0.300000000000000, in steps is 6000
 2024-04-30 11:30:55) Info: Next lattice write time is 8000
 2024-04-30 11:30:56) Info: Time is 0.400000000000000
 2024-04-30 11:30:56) Info: Lattice write time is 0.400000000000000, in steps is 8000
 2024-04-30 11:30:56) Info: Next lattice write time is 10000
 2024-04-30 11:30:57) Info: Time is 0.500000000000000
 2024-04-30 11:30:57) Info: Lattice write time is 0.500000000000000, in steps is 10000
 2024-04-30 11:30:57) Info: Next lattice write time is 12000
 2024-04-30 11:30:58) Info: Time is 0.600000000000000
 2024-04-30 11:30:58) Info: Lattice write time is 0.600000000000000, in steps is 12000
 2024-04-30 11:30:58) Info: Next lattice write time is 14000
 2024-04-30 11:30:59) Info: Time is 0.700000000000000
 2024-04-30 11:30:59) Info: Lattice write time is 0.700000000000000, in steps is 14000
 2024-04-30 11:30:59) Info: Next lattice write time is 16000
 2024-04-30 11:31:00) Info: Time is 0.800000000000000
 2024-04-30 11:31:00) Info: Lattice write time is 0.800000000000000, in steps is 16000
 2024-04-30 11:31:00) Info: Next lattice write time is 18000
 2024-04-30 11:31:01) Info: Time is 0.900000000000000
 2024-04-30 11:31:01) Info: Lattice write time is 0.900000000000000, in steps is 18000
 2024-04-30 11:31:01) Info: Next lattice write time is 20000
 2024-04-30 11:31:02) Info: Time is 1.000000000000000
 2024-04-30 11:31:02) Info: Lattice write time is 1.000000000000000, in steps is 20000
 2024-04-30 11:31:02) Info: Next lattice write time is 22000
 2024-04-30 11:31:03) Info: Time is 1.100000000000000
 2024-04-30 11:31:03) Info: Lattice write time is 1.100000000000000, in steps is 22000
 2024-04-30 11:31:03) Info: Next lattice write time is 24000
 2024-04-30 11:31:04) Info: Time is 1.200000000000000
 2024-04-30 11:31:04) Info: Lattice write time is 1.200000000000000, in steps is 24000
 2024-04-30 11:31:04) Info: Next lattice write time is 26000
 2024-04-30 11:31:05) Info: Time is 1.300000000000000

2024-04-30 11:31:05) Info: Lattice write time is 1.300000000000000, in steps is 26000
2024-04-30 11:31:05) Info: Next lattice write time is 28000
2024-04-30 11:31:06) Info: Time is 1.400000000000000
2024-04-30 11:31:06) Info: Lattice write time is 1.400000000000000, in steps is 28000
2024-04-30 11:31:06) Info: Next lattice write time is 30000
2024-04-30 11:31:07) Info: Time is 1.500000000000000
2024-04-30 11:31:07) Info: Lattice write time is 1.500000000000000, in steps is 30000
2024-04-30 11:31:07) Info: Next lattice write time is 32000
2024-04-30 11:31:08) Info: Time is 1.600000000000000
2024-04-30 11:31:08) Info: Lattice write time is 1.600000000000000, in steps is 32000
2024-04-30 11:31:08) Info: Next lattice write time is 34000
2024-04-30 11:31:09) Info: Time is 1.700000000000000
2024-04-30 11:31:09) Info: Lattice write time is 1.700000000000000, in steps is 34000
2024-04-30 11:31:09) Info: Next lattice write time is 36000
2024-04-30 11:31:10) Info: Time is 1.800000000000000
2024-04-30 11:31:10) Info: Lattice write time is 1.800000000000000, in steps is 36000
2024-04-30 11:31:10) Info: Next lattice write time is 38000
2024-04-30 11:31:11) Info: Time is 1.900000000000000
2024-04-30 11:31:11) Info: Lattice write time is 1.900000000000000, in steps is 38000
2024-04-30 11:31:11) Info: Next lattice write time is 40000
2024-04-30 11:31:12) Info: Time is 2.000000000000000
2024-04-30 11:31:12) Info: Lattice write time is 2.000000000000000, in steps is 40000
2024-04-30 11:31:12) Info: Next lattice write time is 42000
2024-04-30 11:31:13) Info: Time is 2.100000000000000
2024-04-30 11:31:13) Info: Lattice write time is 2.100000000000000, in steps is 42000
2024-04-30 11:31:13) Info: Next lattice write time is 44000
2024-04-30 11:31:14) Info: Time is 2.200000000000000
2024-04-30 11:31:14) Info: Lattice write time is 2.200000000000000, in steps is 44000
2024-04-30 11:31:14) Info: Next lattice write time is 46000
2024-04-30 11:31:15) Info: Time is 2.300000000000000
2024-04-30 11:31:15) Info: Lattice write time is 2.300000000000000, in steps is 46000
2024-04-30 11:31:15) Info: Next lattice write time is 48000
2024-04-30 11:31:16) Info: Time is 2.400000000000000
2024-04-30 11:31:16) Info: Lattice write time is 2.400000000000000, in steps is 48000
2024-04-30 11:31:16) Info: Next lattice write time is 50000
2024-04-30 11:31:17) Info: Time is 2.500000000000000

2024-04-30 11:31:17) Info: Lattice write time is 2.500000000000000, in steps is 50000
2024-04-30 11:31:17) Info: Next lattice write time is 52000
2024-04-30 11:31:18) Info: Time is 2.600000000000000
2024-04-30 11:31:18) Info: Lattice write time is 2.600000000000000, in steps is 52000
2024-04-30 11:31:18) Info: Next lattice write time is 54000
2024-04-30 11:31:19) Info: Time is 2.700000000000000
2024-04-30 11:31:19) Info: Lattice write time is 2.700000000000000, in steps is 54000
2024-04-30 11:31:19) Info: Next lattice write time is 56000
2024-04-30 11:31:20) Info: Time is 2.800000000000000
2024-04-30 11:31:20) Info: Lattice write time is 2.800000000000000, in steps is 56000
2024-04-30 11:31:20) Info: Next lattice write time is 58000
2024-04-30 11:31:21) Info: Time is 2.900000000000000
2024-04-30 11:31:21) Info: Lattice write time is 2.900000000000000, in steps is 58000
2024-04-30 11:31:21) Info: Next lattice write time is 60000
2024-04-30 11:31:22) Info: Time is 3.000000000000000
2024-04-30 11:31:22) Info: Lattice write time is 3.000000000000000, in steps is 60000
2024-04-30 11:31:22) Info: Next lattice write time is 62000
2024-04-30 11:31:23) Info: Time is 3.100000000000000
2024-04-30 11:31:23) Info: Lattice write time is 3.100000000000000, in steps is 62000
2024-04-30 11:31:23) Info: Next lattice write time is 64000
2024-04-30 11:31:24) Info: Time is 3.200000000000000
2024-04-30 11:31:24) Info: Lattice write time is 3.200000000000000, in steps is 64000
2024-04-30 11:31:24) Info: Next lattice write time is 66000
2024-04-30 11:31:25) Info: Time is 3.300000000000000
2024-04-30 11:31:25) Info: Lattice write time is 3.300000000000000, in steps is 66000
2024-04-30 11:31:25) Info: Next lattice write time is 68000
2024-04-30 11:31:26) Info: Time is 3.400000000000000
2024-04-30 11:31:26) Info: Lattice write time is 3.400000000000000, in steps is 68000
2024-04-30 11:31:26) Info: Next lattice write time is 70000
2024-04-30 11:31:27) Info: Time is 3.500000000000000
2024-04-30 11:31:27) Info: Lattice write time is 3.500000000000000, in steps is 70000
2024-04-30 11:31:27) Info: Next lattice write time is 72000
2024-04-30 11:31:28) Info: Time is 3.600000000000000
2024-04-30 11:31:28) Info: Lattice write time is 3.600000000000000, in steps is 72000
2024-04-30 11:31:28) Info: Next lattice write time is 74000
2024-04-30 11:31:29) Info: Time is 3.700000000000000

2024-04-30 11:31:29) Info: Lattice write time is 3.700000000000000, in steps is 74000
2024-04-30 11:31:29) Info: Next lattice write time is 76000
2024-04-30 11:31:30) Info: Time is 3.800000000000000
2024-04-30 11:31:30) Info: Lattice write time is 3.800000000000000, in steps is 76000
2024-04-30 11:31:30) Info: Next lattice write time is 78000
2024-04-30 11:31:31) Info: Time is 3.900000000000000
2024-04-30 11:31:31) Info: Lattice write time is 3.900000000000000, in steps is 78000
2024-04-30 11:31:31) Info: Next lattice write time is 80000
2024-04-30 11:31:32) Info: Time is 4.000000000000000
2024-04-30 11:31:32) Info: Lattice write time is 4.000000000000000, in steps is 80000
2024-04-30 11:31:32) Info: Next lattice write time is 82000
2024-04-30 11:31:33) Info: Time is 4.100000000000000
2024-04-30 11:31:33) Info: Lattice write time is 4.100000000000000, in steps is 82000
2024-04-30 11:31:33) Info: Next lattice write time is 84000
2024-04-30 11:31:34) Info: Time is 4.200000000000000
2024-04-30 11:31:34) Info: Lattice write time is 4.200000000000000, in steps is 84000
2024-04-30 11:31:34) Info: Next lattice write time is 86000
2024-04-30 11:31:35) Info: Time is 4.300000000000000
2024-04-30 11:31:35) Info: Lattice write time is 4.300000000000000, in steps is 86000
2024-04-30 11:31:35) Info: Next lattice write time is 88000
2024-04-30 11:31:36) Info: Time is 4.400000000000000
2024-04-30 11:31:36) Info: Lattice write time is 4.400000000000000, in steps is 88000
2024-04-30 11:31:36) Info: Next lattice write time is 90000
2024-04-30 11:31:37) Info: Time is 4.500000000000000
2024-04-30 11:31:37) Info: Lattice write time is 4.500000000000000, in steps is 90000
2024-04-30 11:31:37) Info: Next lattice write time is 92000
2024-04-30 11:31:37) Info: Time is 4.600000000000000
2024-04-30 11:31:37) Info: Lattice write time is 4.600000000000000, in steps is 92000
2024-04-30 11:31:37) Info: Next lattice write time is 94000
2024-04-30 11:31:38) Info: Time is 4.700000000000000
2024-04-30 11:31:38) Info: Lattice write time is 4.700000000000000, in steps is 94000
2024-04-30 11:31:38) Info: Next lattice write time is 96000
2024-04-30 11:31:39) Info: Time is 4.800000000000000
2024-04-30 11:31:39) Info: Lattice write time is 4.800000000000000, in steps is 96000
2024-04-30 11:31:39) Info: Next lattice write time is 98000
2024-04-30 11:31:40) Info: Time is 4.900000000000000

2024-04-30 11:31:40) Info: Lattice write time is 4.900000000000000, in steps is 98000
2024-04-30 11:31:40) Info: Next lattice write time is 100000
2024-04-30 11:31:41) Info: Time is 5.000000000000000
2024-04-30 11:31:41) Info: Lattice write time is 5.000000000000000, in steps is 100000
2024-04-30 11:31:41) Info: Next lattice write time is 102000
2024-04-30 11:31:42) Info: Time is 5.100000000000000
2024-04-30 11:31:42) Info: Lattice write time is 5.100000000000000, in steps is 102000
2024-04-30 11:31:42) Info: Next lattice write time is 104000
2024-04-30 11:31:43) Info: Time is 5.200000000000000
2024-04-30 11:31:43) Info: Lattice write time is 5.200000000000000, in steps is 104000
2024-04-30 11:31:43) Info: Next lattice write time is 106000
2024-04-30 11:31:44) Info: Time is 5.300000000000000
2024-04-30 11:31:44) Info: Lattice write time is 5.300000000000000, in steps is 106000
2024-04-30 11:31:44) Info: Next lattice write time is 108000
2024-04-30 11:31:45) Info: Time is 5.400000000000000
2024-04-30 11:31:45) Info: Lattice write time is 5.400000000000000, in steps is 108000
2024-04-30 11:31:45) Info: Next lattice write time is 110000
2024-04-30 11:31:46) Info: Time is 5.500000000000000
2024-04-30 11:31:46) Info: Lattice write time is 5.500000000000000, in steps is 110000
2024-04-30 11:31:46) Info: Next lattice write time is 112000
2024-04-30 11:31:47) Info: Time is 5.600000000000000
2024-04-30 11:31:47) Info: Lattice write time is 5.600000000000000, in steps is 112000
2024-04-30 11:31:47) Info: Next lattice write time is 114000
2024-04-30 11:31:48) Info: Time is 5.700000000000000
2024-04-30 11:31:48) Info: Lattice write time is 5.700000000000000, in steps is 114000
2024-04-30 11:31:48) Info: Next lattice write time is 116000
2024-04-30 11:31:49) Info: Time is 5.800000000000000
2024-04-30 11:31:49) Info: Lattice write time is 5.800000000000000, in steps is 116000
2024-04-30 11:31:49) Info: Next lattice write time is 118000
2024-04-30 11:31:50) Info: Time is 5.900000000000000
2024-04-30 11:31:50) Info: Lattice write time is 5.900000000000000, in steps is 118000
2024-04-30 11:31:50) Info: Next lattice write time is 120000
2024-04-30 11:31:51) Info: Time is 6.000000000000000
2024-04-30 11:31:51) Info: Lattice write time is 6.000000000000000, in steps is 120000
2024-04-30 11:31:51) Info: Next lattice write time is 122000
2024-04-30 11:31:52) Info: Average walltime per timestep: 0.49 ms. Progress:

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6.0614s/30.0000s ( 20.2% done / 3.9 minutes walltime remaining)
2024-04-30 11:31:52) Info: Time is 6.100000000000000
2024-04-30 11:31:52) Info: Lattice write time is 6.100000000000000, in steps is
122000
2024-04-30 11:31:52) Info: Next lattice write time is 124000
2024-04-30 11:31:52) Info: Wrote 61 data sets (1023412677 bytes) in the last
60.48 seconds (1.87 seconds writing). 0 datasets queued. Flushing.
2024-04-30 11:31:53) Info: Time is 6.200000000000000
2024-04-30 11:31:53) Info: Lattice write time is 6.200000000000000, in steps is
124000
2024-04-30 11:31:53) Info: Next lattice write time is 126000
2024-04-30 11:31:54) Info: Time is 6.300000000000000
2024-04-30 11:31:54) Info: Lattice write time is 6.300000000000000, in steps is
126000
2024-04-30 11:31:54) Info: Next lattice write time is 128000
2024-04-30 11:31:55) Info: Time is 6.400000000000000
2024-04-30 11:31:55) Info: Lattice write time is 6.400000000000000, in steps is
128000
2024-04-30 11:31:55) Info: Next lattice write time is 130000
2024-04-30 11:31:56) Info: Time is 6.500000000000000
2024-04-30 11:31:56) Info: Lattice write time is 6.500000000000000, in steps is
130000
2024-04-30 11:31:56) Info: Next lattice write time is 132000
2024-04-30 11:31:57) Info: Time is 6.600000000000000
2024-04-30 11:31:57) Info: Lattice write time is 6.600000000000000, in steps is
132000
2024-04-30 11:31:57) Info: Next lattice write time is 134000
2024-04-30 11:31:58) Info: Time is 6.700000000000000
2024-04-30 11:31:58) Info: Lattice write time is 6.700000000000000, in steps is
134000
2024-04-30 11:31:58) Info: Next lattice write time is 136000
2024-04-30 11:31:58) Info: Time is 6.800000000000000
2024-04-30 11:31:58) Info: Lattice write time is 6.800000000000000, in steps is
136000
2024-04-30 11:31:58) Info: Next lattice write time is 138000
2024-04-30 11:31:59) Info: Time is 6.900000000000000
2024-04-30 11:31:59) Info: Lattice write time is 6.900000000000000, in steps is
138000
2024-04-30 11:31:59) Info: Next lattice write time is 140000
2024-04-30 11:32:00) Info: Time is 7.000000000000000
2024-04-30 11:32:00) Info: Lattice write time is 7.000000000000000, in steps is
140000
2024-04-30 11:32:00) Info: Next lattice write time is 142000
2024-04-30 11:32:01) Info: Time is 7.100000000000000
2024-04-30 11:32:01) Info: Lattice write time is 7.100000000000000, in steps is
142000
2024-04-30 11:32:01) Info: Next lattice write time is 144000
2024-04-30 11:32:02) Info: Time is 7.200000000000000

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2024-04-30 11:32:02) Info: Lattice write time is 7.20000000000000, in steps is 144000
2024-04-30 11:32:02) Info: Next lattice write time is 146000
2024-04-30 11:32:03) Info: Time is 7.30000000000000
2024-04-30 11:32:03) Info: Lattice write time is 7.30000000000000, in steps is 146000
2024-04-30 11:32:03) Info: Next lattice write time is 148000
2024-04-30 11:32:04) Info: Time is 7.40000000000000
2024-04-30 11:32:04) Info: Lattice write time is 7.40000000000000, in steps is 148000
2024-04-30 11:32:04) Info: Next lattice write time is 150000
2024-04-30 11:32:05) Info: Time is 7.50000000000000
2024-04-30 11:32:05) Info: Lattice write time is 7.50000000000000, in steps is 150000
2024-04-30 11:32:05) Info: Next lattice write time is 152000
2024-04-30 11:32:06) Info: Time is 7.60000000000000
2024-04-30 11:32:06) Info: Lattice write time is 7.60000000000000, in steps is 152000
2024-04-30 11:32:06) Info: Next lattice write time is 154000
2024-04-30 11:32:07) Info: Time is 7.70000000000000
2024-04-30 11:32:07) Info: Lattice write time is 7.70000000000000, in steps is 154000
2024-04-30 11:32:07) Info: Next lattice write time is 156000
2024-04-30 11:32:08) Info: Time is 7.80000000000000
2024-04-30 11:32:08) Info: Lattice write time is 7.80000000000000, in steps is 156000
2024-04-30 11:32:08) Info: Next lattice write time is 158000
2024-04-30 11:32:09) Info: Time is 7.90000000000000
2024-04-30 11:32:09) Info: Lattice write time is 7.90000000000000, in steps is 158000
2024-04-30 11:32:09) Info: Next lattice write time is 160000
2024-04-30 11:32:10) Info: Time is 8.00000000000000
2024-04-30 11:32:10) Info: Lattice write time is 8.00000000000000, in steps is 160000
2024-04-30 11:32:10) Info: Next lattice write time is 162000
2024-04-30 11:32:11) Info: Time is 8.10000000000000
2024-04-30 11:32:11) Info: Lattice write time is 8.10000000000000, in steps is 162000
2024-04-30 11:32:11) Info: Next lattice write time is 164000
2024-04-30 11:32:11) Info: Time is 8.20000000000000
2024-04-30 11:32:11) Info: Lattice write time is 8.20000000000000, in steps is 164000
2024-04-30 11:32:11) Info: Next lattice write time is 166000
2024-04-30 11:32:12) Info: Time is 8.30000000000000
2024-04-30 11:32:12) Info: Lattice write time is 8.30000000000000, in steps is 166000
2024-04-30 11:32:12) Info: Next lattice write time is 168000
2024-04-30 11:32:13) Info: Time is 8.40000000000000

2024-04-30 11:32:13) Info: Lattice write time is 8.400000000000000, in steps is 168000
2024-04-30 11:32:13) Info: Next lattice write time is 170000
2024-04-30 11:32:14) Info: Time is 8.500000000000000
2024-04-30 11:32:14) Info: Lattice write time is 8.500000000000000, in steps is 170000
2024-04-30 11:32:14) Info: Next lattice write time is 172000
2024-04-30 11:32:15) Info: Time is 8.600000000000000
2024-04-30 11:32:15) Info: Lattice write time is 8.600000000000000, in steps is 172000
2024-04-30 11:32:15) Info: Next lattice write time is 174000
2024-04-30 11:32:16) Info: Time is 8.700000000000000
2024-04-30 11:32:16) Info: Lattice write time is 8.700000000000000, in steps is 174000
2024-04-30 11:32:16) Info: Next lattice write time is 176000
2024-04-30 11:32:17) Info: Time is 8.800000000000000
2024-04-30 11:32:17) Info: Lattice write time is 8.800000000000000, in steps is 176000
2024-04-30 11:32:17) Info: Next lattice write time is 178000
2024-04-30 11:32:18) Info: Time is 8.900000000000000
2024-04-30 11:32:18) Info: Lattice write time is 8.900000000000000, in steps is 178000
2024-04-30 11:32:18) Info: Next lattice write time is 180000
2024-04-30 11:32:19) Info: Time is 9.000000000000000
2024-04-30 11:32:19) Info: Lattice write time is 9.000000000000000, in steps is 180000
2024-04-30 11:32:19) Info: Next lattice write time is 182000
2024-04-30 11:32:20) Info: Time is 9.100000000000000
2024-04-30 11:32:20) Info: Lattice write time is 9.100000000000000, in steps is 182000
2024-04-30 11:32:20) Info: Next lattice write time is 184000
2024-04-30 11:32:21) Info: Time is 9.200000000000000
2024-04-30 11:32:21) Info: Lattice write time is 9.200000000000000, in steps is 184000
2024-04-30 11:32:21) Info: Next lattice write time is 186000
2024-04-30 11:32:22) Info: Time is 9.300000000000000
2024-04-30 11:32:22) Info: Lattice write time is 9.300000000000000, in steps is 186000
2024-04-30 11:32:22) Info: Next lattice write time is 188000
2024-04-30 11:32:23) Info: Time is 9.400000000000000
2024-04-30 11:32:23) Info: Lattice write time is 9.400000000000000, in steps is 188000
2024-04-30 11:32:23) Info: Next lattice write time is 190000
2024-04-30 11:32:24) Info: Time is 9.500000000000000
2024-04-30 11:32:24) Info: Lattice write time is 9.500000000000000, in steps is 190000
2024-04-30 11:32:24) Info: Next lattice write time is 192000
2024-04-30 11:32:25) Info: Time is 9.600000000000000

2024-04-30 11:32:25) Info: Lattice write time is 9.600000000000000, in steps is 192000
2024-04-30 11:32:25) Info: Next lattice write time is 194000
2024-04-30 11:32:26) Info: Time is 9.700000000000000
2024-04-30 11:32:26) Info: Lattice write time is 9.700000000000000, in steps is 194000
2024-04-30 11:32:26) Info: Next lattice write time is 196000
2024-04-30 11:32:27) Info: Time is 9.800000000000000
2024-04-30 11:32:27) Info: Lattice write time is 9.800000000000000, in steps is 196000
2024-04-30 11:32:27) Info: Next lattice write time is 198000
2024-04-30 11:32:27) Info: Time is 9.900000000000000
2024-04-30 11:32:27) Info: Lattice write time is 9.900000000000000, in steps is 198000
2024-04-30 11:32:27) Info: Next lattice write time is 200000
2024-04-30 11:32:28) Info: Time is 10.000000000000000
2024-04-30 11:32:28) Info: Lattice write time is 10.000000000000000, in steps is 200000
2024-04-30 11:32:28) Info: Next lattice write time is 202000
2024-04-30 11:32:29) Info: Time is 10.100000000000000
2024-04-30 11:32:29) Info: Lattice write time is 10.100000000000000, in steps is 202000
2024-04-30 11:32:29) Info: Next lattice write time is 204000
2024-04-30 11:32:30) Info: Time is 10.200000000000000
2024-04-30 11:32:30) Info: Lattice write time is 10.200000000000000, in steps is 204000
2024-04-30 11:32:30) Info: Next lattice write time is 206000
2024-04-30 11:32:31) Info: Time is 10.300000000000000
2024-04-30 11:32:31) Info: Lattice write time is 10.300000000000000, in steps is 206000
2024-04-30 11:32:31) Info: Next lattice write time is 208000
2024-04-30 11:32:32) Info: Time is 10.400000000000000
2024-04-30 11:32:32) Info: Lattice write time is 10.400000000000000, in steps is 208000
2024-04-30 11:32:32) Info: Next lattice write time is 210000
2024-04-30 11:32:33) Info: Time is 10.500000000000000
2024-04-30 11:32:33) Info: Lattice write time is 10.500000000000000, in steps is 210000
2024-04-30 11:32:33) Info: Next lattice write time is 212000
2024-04-30 11:32:34) Info: Time is 10.600000000000000
2024-04-30 11:32:34) Info: Lattice write time is 10.600000000000000, in steps is 212000
2024-04-30 11:32:34) Info: Next lattice write time is 214000
2024-04-30 11:32:35) Info: Time is 10.700000000000000
2024-04-30 11:32:35) Info: Lattice write time is 10.700000000000000, in steps is 214000
2024-04-30 11:32:35) Info: Next lattice write time is 216000
2024-04-30 11:32:36) Info: Time is 10.800000000000000

2024-04-30 11:32:36) Info: Lattice write time is 10.800000000000000, in steps is 216000
2024-04-30 11:32:36) Info: Next lattice write time is 218000
2024-04-30 11:32:37) Info: Time is 10.900000000000000
2024-04-30 11:32:37) Info: Lattice write time is 10.900000000000000, in steps is 218000
2024-04-30 11:32:37) Info: Next lattice write time is 220000
2024-04-30 11:32:38) Info: Time is 11.000000000000000
2024-04-30 11:32:38) Info: Lattice write time is 11.000000000000000, in steps is 220000
2024-04-30 11:32:38) Info: Next lattice write time is 222000
2024-04-30 11:32:39) Info: Time is 11.100000000000000
2024-04-30 11:32:39) Info: Lattice write time is 11.100000000000000, in steps is 222000
2024-04-30 11:32:39) Info: Next lattice write time is 224000
2024-04-30 11:32:40) Info: Time is 11.200000000000000
2024-04-30 11:32:40) Info: Lattice write time is 11.200000000000000, in steps is 224000
2024-04-30 11:32:40) Info: Next lattice write time is 226000
2024-04-30 11:32:41) Info: Time is 11.300000000000000
2024-04-30 11:32:41) Info: Lattice write time is 11.300000000000000, in steps is 226000
2024-04-30 11:32:41) Info: Next lattice write time is 228000
2024-04-30 11:32:42) Info: Time is 11.400000000000000
2024-04-30 11:32:42) Info: Lattice write time is 11.400000000000000, in steps is 228000
2024-04-30 11:32:42) Info: Next lattice write time is 230000
2024-04-30 11:32:43) Info: Time is 11.500000000000000
2024-04-30 11:32:43) Info: Lattice write time is 11.500000000000000, in steps is 230000
2024-04-30 11:32:43) Info: Next lattice write time is 232000
2024-04-30 11:32:44) Info: Time is 11.600000000000000
2024-04-30 11:32:44) Info: Lattice write time is 11.600000000000000, in steps is 232000
2024-04-30 11:32:44) Info: Next lattice write time is 234000
2024-04-30 11:32:45) Info: Time is 11.700000000000000
2024-04-30 11:32:45) Info: Lattice write time is 11.700000000000000, in steps is 234000
2024-04-30 11:32:45) Info: Next lattice write time is 236000
2024-04-30 11:32:46) Info: Time is 11.800000000000000
2024-04-30 11:32:46) Info: Lattice write time is 11.800000000000000, in steps is 236000
2024-04-30 11:32:46) Info: Next lattice write time is 238000
2024-04-30 11:32:47) Info: Time is 11.900000000000000
2024-04-30 11:32:47) Info: Lattice write time is 11.900000000000000, in steps is 238000
2024-04-30 11:32:47) Info: Next lattice write time is 240000
2024-04-30 11:32:48) Info: Time is 12.000000000000000

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2024-04-30 11:32:48) Info: Lattice write time is 12.00000000000000, in steps is
240000
2024-04-30 11:32:48) Info: Next lattice write time is 242000
2024-04-30 11:32:49) Info: Time is 12.10000000000000
2024-04-30 11:32:49) Info: Lattice write time is 12.10000000000000, in steps is
242000
2024-04-30 11:32:49) Info: Next lattice write time is 244000
2024-04-30 11:32:50) Info: Time is 12.20000000000000
2024-04-30 11:32:50) Info: Lattice write time is 12.20000000000000, in steps is
244000
2024-04-30 11:32:50) Info: Next lattice write time is 246000
2024-04-30 11:32:51) Info: Time is 12.30000000000000
2024-04-30 11:32:51) Info: Lattice write time is 12.30000000000000, in steps is
246000
2024-04-30 11:32:51) Info: Next lattice write time is 248000
2024-04-30 11:32:52) Info: Average walltime per timestep: 0.47 ms. Progress:
12.3981s/30.0000s ( 41.3% done / 2.8 minutes walltime remaining)
2024-04-30 11:32:52) Info: Time is 12.40000000000000
2024-04-30 11:32:52) Info: Lattice write time is 12.40000000000000, in steps is
248000
2024-04-30 11:32:52) Info: Next lattice write time is 250000
2024-04-30 11:32:53) Info: Time is 12.50000000000000
2024-04-30 11:32:53) Info: Lattice write time is 12.50000000000000, in steps is
250000
2024-04-30 11:32:53) Info: Next lattice write time is 252000
2024-04-30 11:32:53) Info: Wrote 64 data sets (1073744448 bytes) in the last
60.66 seconds (1.96 seconds writing). 0 datasets queued. Flushing.
2024-04-30 11:32:54) Info: Time is 12.60000000000000
2024-04-30 11:32:54) Info: Lattice write time is 12.60000000000000, in steps is
252000
2024-04-30 11:32:54) Info: Next lattice write time is 254000
2024-04-30 11:32:55) Info: Time is 12.70000000000000
2024-04-30 11:32:55) Info: Lattice write time is 12.70000000000000, in steps is
254000
2024-04-30 11:32:55) Info: Next lattice write time is 256000
2024-04-30 11:32:55) Info: Time is 12.80000000000000
2024-04-30 11:32:55) Info: Lattice write time is 12.80000000000000, in steps is
256000
2024-04-30 11:32:55) Info: Next lattice write time is 258000
2024-04-30 11:32:56) Info: Time is 12.90000000000000
2024-04-30 11:32:56) Info: Lattice write time is 12.90000000000000, in steps is
258000
2024-04-30 11:32:56) Info: Next lattice write time is 260000
2024-04-30 11:32:57) Info: Time is 13.00000000000000
2024-04-30 11:32:57) Info: Lattice write time is 13.00000000000000, in steps is
260000
2024-04-30 11:32:57) Info: Next lattice write time is 262000
2024-04-30 11:32:58) Info: Time is 13.10000000000000

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2024-04-30 11:32:58) Info: Lattice write time is 13.100000000000000, in steps is 262000
2024-04-30 11:32:58) Info: Next lattice write time is 264000
2024-04-30 11:32:59) Info: Time is 13.200000000000000
2024-04-30 11:32:59) Info: Lattice write time is 13.200000000000000, in steps is 264000
2024-04-30 11:32:59) Info: Next lattice write time is 266000
2024-04-30 11:33:00) Info: Time is 13.300000000000000
2024-04-30 11:33:00) Info: Lattice write time is 13.300000000000000, in steps is 266000
2024-04-30 11:33:00) Info: Next lattice write time is 268000
2024-04-30 11:33:01) Info: Time is 13.400000000000000
2024-04-30 11:33:01) Info: Lattice write time is 13.400000000000000, in steps is 268000
2024-04-30 11:33:01) Info: Next lattice write time is 270000
2024-04-30 11:33:02) Info: Time is 13.500000000000000
2024-04-30 11:33:02) Info: Lattice write time is 13.500000000000000, in steps is 270000
2024-04-30 11:33:02) Info: Next lattice write time is 272000
2024-04-30 11:33:03) Info: Time is 13.600000000000000
2024-04-30 11:33:03) Info: Lattice write time is 13.600000000000000, in steps is 272000
2024-04-30 11:33:03) Info: Next lattice write time is 274000
2024-04-30 11:33:04) Info: Time is 13.700000000000000
2024-04-30 11:33:04) Info: Lattice write time is 13.700000000000000, in steps is 274000
2024-04-30 11:33:04) Info: Next lattice write time is 276000
2024-04-30 11:33:05) Info: Time is 13.800000000000000
2024-04-30 11:33:05) Info: Lattice write time is 13.800000000000000, in steps is 276000
2024-04-30 11:33:05) Info: Next lattice write time is 278000
2024-04-30 11:33:06) Info: Time is 13.900000000000000
2024-04-30 11:33:06) Info: Lattice write time is 13.900000000000000, in steps is 278000
2024-04-30 11:33:06) Info: Next lattice write time is 280000
2024-04-30 11:33:07) Info: Time is 14.000000000000000
2024-04-30 11:33:07) Info: Lattice write time is 14.000000000000000, in steps is 280000
2024-04-30 11:33:07) Info: Next lattice write time is 282000
2024-04-30 11:33:08) Info: Time is 14.100000000000000
2024-04-30 11:33:08) Info: Lattice write time is 14.100000000000000, in steps is 282000
2024-04-30 11:33:08) Info: Next lattice write time is 284000
2024-04-30 11:33:09) Info: Time is 14.200000000000000
2024-04-30 11:33:09) Info: Lattice write time is 14.200000000000000, in steps is 284000
2024-04-30 11:33:09) Info: Next lattice write time is 286000
2024-04-30 11:33:10) Info: Time is 14.300000000000000

2024-04-30 11:33:10) Info: Lattice write time is 14.300000000000000, in steps is 286000
2024-04-30 11:33:10) Info: Next lattice write time is 288000
2024-04-30 11:33:11) Info: Time is 14.400000000000000
2024-04-30 11:33:11) Info: Lattice write time is 14.400000000000000, in steps is 288000
2024-04-30 11:33:11) Info: Next lattice write time is 290000
2024-04-30 11:33:11) Info: Time is 14.500000000000000
2024-04-30 11:33:11) Info: Lattice write time is 14.500000000000000, in steps is 290000
2024-04-30 11:33:11) Info: Next lattice write time is 292000
2024-04-30 11:33:12) Info: Time is 14.600000000000000
2024-04-30 11:33:12) Info: Lattice write time is 14.600000000000000, in steps is 292000
2024-04-30 11:33:12) Info: Next lattice write time is 294000
2024-04-30 11:33:13) Info: Time is 14.700000000000000
2024-04-30 11:33:13) Info: Lattice write time is 14.700000000000000, in steps is 294000
2024-04-30 11:33:13) Info: Next lattice write time is 296000
2024-04-30 11:33:14) Info: Time is 14.800000000000000
2024-04-30 11:33:14) Info: Lattice write time is 14.800000000000000, in steps is 296000
2024-04-30 11:33:14) Info: Next lattice write time is 298000
2024-04-30 11:33:15) Info: Time is 14.900000000000000
2024-04-30 11:33:15) Info: Lattice write time is 14.900000000000000, in steps is 298000
2024-04-30 11:33:15) Info: Next lattice write time is 300000
2024-04-30 11:33:16) Info: Time is 15.000000000000000
2024-04-30 11:33:16) Info: Lattice write time is 15.000000000000000, in steps is 300000
2024-04-30 11:33:16) Info: Next lattice write time is 302000
2024-04-30 11:33:17) Info: Time is 15.100000000000000
2024-04-30 11:33:17) Info: Lattice write time is 15.100000000000000, in steps is 302000
2024-04-30 11:33:17) Info: Next lattice write time is 304000
2024-04-30 11:33:18) Info: Time is 15.200000000000000
2024-04-30 11:33:18) Info: Lattice write time is 15.200000000000000, in steps is 304000
2024-04-30 11:33:18) Info: Next lattice write time is 306000
2024-04-30 11:33:19) Info: Time is 15.300000000000000
2024-04-30 11:33:19) Info: Lattice write time is 15.300000000000000, in steps is 306000
2024-04-30 11:33:19) Info: Next lattice write time is 308000
2024-04-30 11:33:20) Info: Time is 15.400000000000000
2024-04-30 11:33:20) Info: Lattice write time is 15.400000000000000, in steps is 308000
2024-04-30 11:33:20) Info: Next lattice write time is 310000
2024-04-30 11:33:21) Info: Time is 15.500000000000000

2024-04-30 11:33:21) Info: Lattice write time is 15.500000000000000, in steps is 310000
2024-04-30 11:33:21) Info: Next lattice write time is 312000
2024-04-30 11:33:22) Info: Time is 15.600000000000000
2024-04-30 11:33:22) Info: Lattice write time is 15.600000000000000, in steps is 312000
2024-04-30 11:33:22) Info: Next lattice write time is 314000
2024-04-30 11:33:23) Info: Time is 15.700000000000000
2024-04-30 11:33:23) Info: Lattice write time is 15.700000000000000, in steps is 314000
2024-04-30 11:33:23) Info: Next lattice write time is 316000
2024-04-30 11:33:24) Info: Time is 15.800000000000000
2024-04-30 11:33:24) Info: Lattice write time is 15.800000000000000, in steps is 316000
2024-04-30 11:33:24) Info: Next lattice write time is 318000
2024-04-30 11:33:25) Info: Time is 15.900000000000000
2024-04-30 11:33:25) Info: Lattice write time is 15.900000000000000, in steps is 318000
2024-04-30 11:33:25) Info: Next lattice write time is 320000
2024-04-30 11:33:26) Info: Time is 16.000000000000000
2024-04-30 11:33:26) Info: Lattice write time is 16.000000000000000, in steps is 320000
2024-04-30 11:33:26) Info: Next lattice write time is 322000
2024-04-30 11:33:26) Info: Time is 16.100000000000000
2024-04-30 11:33:26) Info: Lattice write time is 16.100000000000000, in steps is 322000
2024-04-30 11:33:26) Info: Next lattice write time is 324000
2024-04-30 11:33:27) Info: Time is 16.200000000000000
2024-04-30 11:33:27) Info: Lattice write time is 16.200000000000000, in steps is 324000
2024-04-30 11:33:27) Info: Next lattice write time is 326000
2024-04-30 11:33:28) Info: Time is 16.300000000000000
2024-04-30 11:33:28) Info: Lattice write time is 16.300000000000000, in steps is 326000
2024-04-30 11:33:28) Info: Next lattice write time is 328000
2024-04-30 11:33:29) Info: Time is 16.400000000000000
2024-04-30 11:33:29) Info: Lattice write time is 16.400000000000000, in steps is 328000
2024-04-30 11:33:29) Info: Next lattice write time is 330000
2024-04-30 11:33:30) Info: Time is 16.500000000000000
2024-04-30 11:33:30) Info: Lattice write time is 16.500000000000000, in steps is 330000
2024-04-30 11:33:30) Info: Next lattice write time is 332000
2024-04-30 11:33:31) Info: Time is 16.600000000000000
2024-04-30 11:33:31) Info: Lattice write time is 16.600000000000000, in steps is 332000
2024-04-30 11:33:31) Info: Next lattice write time is 334000
2024-04-30 11:33:32) Info: Time is 16.700000000000000

2024-04-30 11:33:32) Info: Lattice write time is 16.700000000000000, in steps is 334000
2024-04-30 11:33:32) Info: Next lattice write time is 336000
2024-04-30 11:33:33) Info: Time is 16.800000000000000
2024-04-30 11:33:33) Info: Lattice write time is 16.800000000000000, in steps is 336000
2024-04-30 11:33:33) Info: Next lattice write time is 338000
2024-04-30 11:33:34) Info: Time is 16.900000000000000
2024-04-30 11:33:34) Info: Lattice write time is 16.900000000000000, in steps is 338000
2024-04-30 11:33:34) Info: Next lattice write time is 340000
2024-04-30 11:33:35) Info: Time is 17.000000000000000
2024-04-30 11:33:35) Info: Lattice write time is 17.000000000000000, in steps is 340000
2024-04-30 11:33:35) Info: Next lattice write time is 342000
2024-04-30 11:33:36) Info: Time is 17.100000000000000
2024-04-30 11:33:36) Info: Lattice write time is 17.100000000000000, in steps is 342000
2024-04-30 11:33:36) Info: Next lattice write time is 344000
2024-04-30 11:33:37) Info: Time is 17.200000000000000
2024-04-30 11:33:37) Info: Lattice write time is 17.200000000000000, in steps is 344000
2024-04-30 11:33:37) Info: Next lattice write time is 346000
2024-04-30 11:33:38) Info: Time is 17.300000000000000
2024-04-30 11:33:38) Info: Lattice write time is 17.300000000000000, in steps is 346000
2024-04-30 11:33:38) Info: Next lattice write time is 348000
2024-04-30 11:33:39) Info: Time is 17.400000000000000
2024-04-30 11:33:39) Info: Lattice write time is 17.400000000000000, in steps is 348000
2024-04-30 11:33:39) Info: Next lattice write time is 350000
2024-04-30 11:33:40) Info: Time is 17.500000000000000
2024-04-30 11:33:40) Info: Lattice write time is 17.500000000000000, in steps is 350000
2024-04-30 11:33:40) Info: Next lattice write time is 352000
2024-04-30 11:33:41) Info: Time is 17.600000000000000
2024-04-30 11:33:41) Info: Lattice write time is 17.600000000000000, in steps is 352000
2024-04-30 11:33:41) Info: Next lattice write time is 354000
2024-04-30 11:33:42) Info: Time is 17.700000000000000
2024-04-30 11:33:42) Info: Lattice write time is 17.700000000000000, in steps is 354000
2024-04-30 11:33:42) Info: Next lattice write time is 356000
2024-04-30 11:33:43) Info: Time is 17.800000000000000
2024-04-30 11:33:43) Info: Lattice write time is 17.800000000000000, in steps is 356000
2024-04-30 11:33:43) Info: Next lattice write time is 358000
2024-04-30 11:33:44) Info: Time is 17.900000000000000

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2024-04-30 11:33:44) Info: Lattice write time is 17.900000000000000, in steps is
358000
2024-04-30 11:33:44) Info: Next lattice write time is 360000
2024-04-30 11:33:45) Info: Time is 18.000000000000000
2024-04-30 11:33:45) Info: Lattice write time is 18.000000000000000, in steps is
360000
2024-04-30 11:33:45) Info: Next lattice write time is 362000
2024-04-30 11:33:46) Info: Time is 18.100000000000000
2024-04-30 11:33:46) Info: Lattice write time is 18.100000000000000, in steps is
362000
2024-04-30 11:33:46) Info: Next lattice write time is 364000
2024-04-30 11:33:47) Info: Time is 18.200000000000000
2024-04-30 11:33:47) Info: Lattice write time is 18.200000000000000, in steps is
364000
2024-04-30 11:33:47) Info: Next lattice write time is 366000
2024-04-30 11:33:48) Info: Time is 18.300000000000000
2024-04-30 11:33:48) Info: Lattice write time is 18.300000000000000, in steps is
366000
2024-04-30 11:33:48) Info: Next lattice write time is 368000
2024-04-30 11:33:49) Info: Time is 18.400000000000000
2024-04-30 11:33:49) Info: Lattice write time is 18.400000000000000, in steps is
368000
2024-04-30 11:33:49) Info: Next lattice write time is 370000
2024-04-30 11:33:50) Info: Time is 18.500000000000000
2024-04-30 11:33:50) Info: Lattice write time is 18.500000000000000, in steps is
370000
2024-04-30 11:33:50) Info: Next lattice write time is 372000
2024-04-30 11:33:51) Info: Time is 18.600000000000000
2024-04-30 11:33:51) Info: Lattice write time is 18.600000000000000, in steps is
372000
2024-04-30 11:33:51) Info: Next lattice write time is 374000
2024-04-30 11:33:52) Info: Average walltime per timestep: 0.48 ms. Progress:
18.6879s/30.0000s ( 62.3% done / 1.8 minutes walltime remaining)
2024-04-30 11:33:52) Info: Time is 18.700000000000000
2024-04-30 11:33:52) Info: Lattice write time is 18.700000000000000, in steps is
374000
2024-04-30 11:33:52) Info: Next lattice write time is 376000
2024-04-30 11:33:53) Info: Time is 18.800000000000000
2024-04-30 11:33:53) Info: Lattice write time is 18.800000000000000, in steps is
376000
2024-04-30 11:33:53) Info: Next lattice write time is 378000
2024-04-30 11:33:53) Info: Wrote 63 data sets (1056967191 bytes) in the last
60.10 seconds (1.93 seconds writing). 0 datasets queued. Flushing.
2024-04-30 11:33:54) Info: Time is 18.900000000000000
2024-04-30 11:33:54) Info: Lattice write time is 18.900000000000000, in steps is
378000
2024-04-30 11:33:54) Info: Next lattice write time is 380000
2024-04-30 11:33:55) Info: Time is 19.000000000000000

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2024-04-30 11:33:55) Info: Lattice write time is 19.00000000000000, in steps is 380000
2024-04-30 11:33:55) Info: Next lattice write time is 382000
2024-04-30 11:33:56) Info: Time is 19.10000000000000
2024-04-30 11:33:56) Info: Lattice write time is 19.10000000000000, in steps is 382000
2024-04-30 11:33:56) Info: Next lattice write time is 384000
2024-04-30 11:33:57) Info: Time is 19.20000000000000
2024-04-30 11:33:57) Info: Lattice write time is 19.20000000000000, in steps is 384000
2024-04-30 11:33:57) Info: Next lattice write time is 386000
2024-04-30 11:33:58) Info: Time is 19.30000000000000
2024-04-30 11:33:58) Info: Lattice write time is 19.30000000000000, in steps is 386000
2024-04-30 11:33:58) Info: Next lattice write time is 388000
2024-04-30 11:33:59) Info: Time is 19.40000000000000
2024-04-30 11:33:59) Info: Lattice write time is 19.40000000000000, in steps is 388000
2024-04-30 11:33:59) Info: Next lattice write time is 390000
2024-04-30 11:34:00) Info: Time is 19.50000000000000
2024-04-30 11:34:00) Info: Lattice write time is 19.50000000000000, in steps is 390000
2024-04-30 11:34:00) Info: Next lattice write time is 392000
2024-04-30 11:34:01) Info: Time is 19.60000000000000
2024-04-30 11:34:01) Info: Lattice write time is 19.60000000000000, in steps is 392000
2024-04-30 11:34:01) Info: Next lattice write time is 394000
2024-04-30 11:34:02) Info: Time is 19.70000000000000
2024-04-30 11:34:02) Info: Lattice write time is 19.70000000000000, in steps is 394000
2024-04-30 11:34:02) Info: Next lattice write time is 396000
2024-04-30 11:34:03) Info: Time is 19.80000000000000
2024-04-30 11:34:03) Info: Lattice write time is 19.80000000000000, in steps is 396000
2024-04-30 11:34:03) Info: Next lattice write time is 398000
2024-04-30 11:34:04) Info: Time is 19.90000000000000
2024-04-30 11:34:04) Info: Lattice write time is 19.90000000000000, in steps is 398000
2024-04-30 11:34:04) Info: Next lattice write time is 400000
2024-04-30 11:34:05) Info: Time is 20.00000000000000
2024-04-30 11:34:05) Info: Lattice write time is 20.00000000000000, in steps is 400000
2024-04-30 11:34:05) Info: Next lattice write time is 402000
2024-04-30 11:34:06) Info: Time is 20.10000000000000
2024-04-30 11:34:06) Info: Lattice write time is 20.10000000000000, in steps is 402000
2024-04-30 11:34:06) Info: Next lattice write time is 404000
2024-04-30 11:34:07) Info: Time is 20.20000000000000

2024-04-30 11:34:07) Info: Lattice write time is 20.20000000000000, in steps is 404000
2024-04-30 11:34:07) Info: Next lattice write time is 406000
2024-04-30 11:34:08) Info: Time is 20.30000000000000
2024-04-30 11:34:08) Info: Lattice write time is 20.30000000000000, in steps is 406000
2024-04-30 11:34:08) Info: Next lattice write time is 408000
2024-04-30 11:34:09) Info: Time is 20.40000000000000
2024-04-30 11:34:09) Info: Lattice write time is 20.40000000000000, in steps is 408000
2024-04-30 11:34:09) Info: Next lattice write time is 410000
2024-04-30 11:34:10) Info: Time is 20.50000000000000
2024-04-30 11:34:10) Info: Lattice write time is 20.50000000000000, in steps is 410000
2024-04-30 11:34:10) Info: Next lattice write time is 412000
2024-04-30 11:34:11) Info: Time is 20.60000000000000
2024-04-30 11:34:11) Info: Lattice write time is 20.60000000000000, in steps is 412000
2024-04-30 11:34:11) Info: Next lattice write time is 414000
2024-04-30 11:34:12) Info: Time is 20.70000000000000
2024-04-30 11:34:12) Info: Lattice write time is 20.70000000000000, in steps is 414000
2024-04-30 11:34:12) Info: Next lattice write time is 416000
2024-04-30 11:34:13) Info: Time is 20.80000000000000
2024-04-30 11:34:13) Info: Lattice write time is 20.80000000000000, in steps is 416000
2024-04-30 11:34:13) Info: Next lattice write time is 418000
2024-04-30 11:34:14) Info: Time is 20.90000000000000
2024-04-30 11:34:14) Info: Lattice write time is 20.90000000000000, in steps is 418000
2024-04-30 11:34:14) Info: Next lattice write time is 420000
2024-04-30 11:34:15) Info: Time is 21.00000000000000
2024-04-30 11:34:15) Info: Lattice write time is 21.00000000000000, in steps is 420000
2024-04-30 11:34:15) Info: Next lattice write time is 422000
2024-04-30 11:34:16) Info: Time is 21.10000000000000
2024-04-30 11:34:16) Info: Lattice write time is 21.10000000000000, in steps is 422000
2024-04-30 11:34:16) Info: Next lattice write time is 424000
2024-04-30 11:34:17) Info: Time is 21.20000000000000
2024-04-30 11:34:17) Info: Lattice write time is 21.20000000000000, in steps is 424000
2024-04-30 11:34:17) Info: Next lattice write time is 426000
2024-04-30 11:34:18) Info: Time is 21.30000000000000
2024-04-30 11:34:18) Info: Lattice write time is 21.30000000000000, in steps is 426000
2024-04-30 11:34:18) Info: Next lattice write time is 428000
2024-04-30 11:34:19) Info: Time is 21.40000000000000

2024-04-30 11:34:19) Info: Lattice write time is 21.40000000000000, in steps is 428000
2024-04-30 11:34:19) Info: Next lattice write time is 430000
2024-04-30 11:34:20) Info: Time is 21.50000000000000
2024-04-30 11:34:20) Info: Lattice write time is 21.50000000000000, in steps is 430000
2024-04-30 11:34:20) Info: Next lattice write time is 432000
2024-04-30 11:34:21) Info: Time is 21.60000000000000
2024-04-30 11:34:21) Info: Lattice write time is 21.60000000000000, in steps is 432000
2024-04-30 11:34:21) Info: Next lattice write time is 434000
2024-04-30 11:34:22) Info: Time is 21.70000000000000
2024-04-30 11:34:22) Info: Lattice write time is 21.70000000000000, in steps is 434000
2024-04-30 11:34:22) Info: Next lattice write time is 436000
2024-04-30 11:34:23) Info: Time is 21.80000000000000
2024-04-30 11:34:23) Info: Lattice write time is 21.80000000000000, in steps is 436000
2024-04-30 11:34:23) Info: Next lattice write time is 438000
2024-04-30 11:34:24) Info: Time is 21.90000000000000
2024-04-30 11:34:24) Info: Lattice write time is 21.90000000000000, in steps is 438000
2024-04-30 11:34:24) Info: Next lattice write time is 440000
2024-04-30 11:34:25) Info: Time is 22.00000000000000
2024-04-30 11:34:25) Info: Lattice write time is 22.00000000000000, in steps is 440000
2024-04-30 11:34:25) Info: Next lattice write time is 442000
2024-04-30 11:34:26) Info: Time is 22.10000000000000
2024-04-30 11:34:26) Info: Lattice write time is 22.10000000000000, in steps is 442000
2024-04-30 11:34:26) Info: Next lattice write time is 444000
2024-04-30 11:34:27) Info: Time is 22.20000000000000
2024-04-30 11:34:27) Info: Lattice write time is 22.20000000000000, in steps is 444000
2024-04-30 11:34:27) Info: Next lattice write time is 446000
2024-04-30 11:34:28) Info: Time is 22.30000000000000
2024-04-30 11:34:28) Info: Lattice write time is 22.30000000000000, in steps is 446000
2024-04-30 11:34:28) Info: Next lattice write time is 448000
2024-04-30 11:34:29) Info: Time is 22.40000000000000
2024-04-30 11:34:29) Info: Lattice write time is 22.40000000000000, in steps is 448000
2024-04-30 11:34:29) Info: Next lattice write time is 450000
2024-04-30 11:34:30) Info: Time is 22.50000000000000
2024-04-30 11:34:30) Info: Lattice write time is 22.50000000000000, in steps is 450000
2024-04-30 11:34:30) Info: Next lattice write time is 452000
2024-04-30 11:34:31) Info: Time is 22.60000000000000

2024-04-30 11:34:31) Info: Lattice write time is 22.60000000000000, in steps is 452000
2024-04-30 11:34:31) Info: Next lattice write time is 454000
2024-04-30 11:34:32) Info: Time is 22.70000000000000
2024-04-30 11:34:32) Info: Lattice write time is 22.70000000000000, in steps is 454000
2024-04-30 11:34:32) Info: Next lattice write time is 456000
2024-04-30 11:34:33) Info: Time is 22.80000000000000
2024-04-30 11:34:33) Info: Lattice write time is 22.80000000000000, in steps is 456000
2024-04-30 11:34:33) Info: Next lattice write time is 458000
2024-04-30 11:34:34) Info: Time is 22.90000000000000
2024-04-30 11:34:34) Info: Lattice write time is 22.90000000000000, in steps is 458000
2024-04-30 11:34:34) Info: Next lattice write time is 460000
2024-04-30 11:34:35) Info: Time is 23.00000000000000
2024-04-30 11:34:35) Info: Lattice write time is 23.00000000000000, in steps is 460000
2024-04-30 11:34:35) Info: Next lattice write time is 462000
2024-04-30 11:34:36) Info: Time is 23.10000000000000
2024-04-30 11:34:36) Info: Lattice write time is 23.10000000000000, in steps is 462000
2024-04-30 11:34:36) Info: Next lattice write time is 464000
2024-04-30 11:34:37) Info: Time is 23.20000000000000
2024-04-30 11:34:37) Info: Lattice write time is 23.20000000000000, in steps is 464000
2024-04-30 11:34:37) Info: Next lattice write time is 466000
2024-04-30 11:34:38) Info: Time is 23.30000000000000
2024-04-30 11:34:38) Info: Lattice write time is 23.30000000000000, in steps is 466000
2024-04-30 11:34:38) Info: Next lattice write time is 468000
2024-04-30 11:34:39) Info: Time is 23.40000000000000
2024-04-30 11:34:39) Info: Lattice write time is 23.40000000000000, in steps is 468000
2024-04-30 11:34:39) Info: Next lattice write time is 470000
2024-04-30 11:34:40) Info: Time is 23.50000000000000
2024-04-30 11:34:40) Info: Lattice write time is 23.50000000000000, in steps is 470000
2024-04-30 11:34:40) Info: Next lattice write time is 472000
2024-04-30 11:34:41) Info: Time is 23.60000000000000
2024-04-30 11:34:41) Info: Lattice write time is 23.60000000000000, in steps is 472000
2024-04-30 11:34:41) Info: Next lattice write time is 474000
2024-04-30 11:34:42) Info: Time is 23.70000000000000
2024-04-30 11:34:42) Info: Lattice write time is 23.70000000000000, in steps is 474000
2024-04-30 11:34:42) Info: Next lattice write time is 476000
2024-04-30 11:34:43) Info: Time is 23.80000000000000

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2024-04-30 11:34:43) Info: Lattice write time is 23.800000000000000, in steps is
476000
2024-04-30 11:34:43) Info: Next lattice write time is 478000
2024-04-30 11:34:44) Info: Time is 23.900000000000000
2024-04-30 11:34:44) Info: Lattice write time is 23.900000000000000, in steps is
478000
2024-04-30 11:34:44) Info: Next lattice write time is 480000
2024-04-30 11:34:45) Info: Time is 24.000000000000000
2024-04-30 11:34:45) Info: Lattice write time is 24.000000000000000, in steps is
480000
2024-04-30 11:34:45) Info: Next lattice write time is 482000
2024-04-30 11:34:46) Info: Time is 24.100000000000000
2024-04-30 11:34:46) Info: Lattice write time is 24.100000000000000, in steps is
482000
2024-04-30 11:34:46) Info: Next lattice write time is 484000
2024-04-30 11:34:47) Info: Time is 24.200000000000000
2024-04-30 11:34:47) Info: Lattice write time is 24.200000000000000, in steps is
484000
2024-04-30 11:34:47) Info: Next lattice write time is 486000
2024-04-30 11:34:48) Info: Time is 24.300000000000000
2024-04-30 11:34:48) Info: Lattice write time is 24.300000000000000, in steps is
486000
2024-04-30 11:34:48) Info: Next lattice write time is 488000
2024-04-30 11:34:49) Info: Time is 24.400000000000000
2024-04-30 11:34:49) Info: Lattice write time is 24.400000000000000, in steps is
488000
2024-04-30 11:34:49) Info: Next lattice write time is 490000
2024-04-30 11:34:50) Info: Time is 24.500000000000000
2024-04-30 11:34:50) Info: Lattice write time is 24.500000000000000, in steps is
490000
2024-04-30 11:34:50) Info: Next lattice write time is 492000
2024-04-30 11:34:51) Info: Time is 24.600000000000000
2024-04-30 11:34:51) Info: Lattice write time is 24.600000000000000, in steps is
492000
2024-04-30 11:34:51) Info: Next lattice write time is 494000
2024-04-30 11:34:52) Info: Average walltime per timestep: 0.50 ms. Progress:
24.6989s/30.0000s ( 82.3% done / 53 seconds walltime remaining)
2024-04-30 11:34:52) Info: Time is 24.700000000000000
2024-04-30 11:34:52) Info: Lattice write time is 24.700000000000000, in steps is
494000
2024-04-30 11:34:52) Info: Next lattice write time is 496000
2024-04-30 11:34:53) Info: Time is 24.800000000000000
2024-04-30 11:34:53) Info: Lattice write time is 24.800000000000000, in steps is
496000
2024-04-30 11:34:53) Info: Next lattice write time is 498000
2024-04-30 11:34:54) Info: Time is 24.900000000000000
2024-04-30 11:34:54) Info: Lattice write time is 24.900000000000000, in steps is
498000

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2024-04-30 11:34:54) Info: Next lattice write time is 500000
2024-04-30 11:34:54) Info: Wrote 61 data sets (1023412677 bytes) in the last
60.91 seconds (1.90 seconds writing). 0 datasets queued. Flushing.
2024-04-30 11:34:55) Info: Time is 25.00000000000000
2024-04-30 11:34:55) Info: Lattice write time is 25.00000000000000, in steps is
500000
2024-04-30 11:34:55) Info: Next lattice write time is 502000
2024-04-30 11:34:56) Info: Time is 25.10000000000000
2024-04-30 11:34:56) Info: Lattice write time is 25.10000000000000, in steps is
502000
2024-04-30 11:34:56) Info: Next lattice write time is 504000
2024-04-30 11:34:57) Info: Time is 25.20000000000000
2024-04-30 11:34:57) Info: Lattice write time is 25.20000000000000, in steps is
504000
2024-04-30 11:34:57) Info: Next lattice write time is 506000
2024-04-30 11:34:58) Info: Time is 25.30000000000000
2024-04-30 11:34:58) Info: Lattice write time is 25.30000000000000, in steps is
506000
2024-04-30 11:34:58) Info: Next lattice write time is 508000
2024-04-30 11:34:59) Info: Time is 25.40000000000000
2024-04-30 11:34:59) Info: Lattice write time is 25.40000000000000, in steps is
508000
2024-04-30 11:34:59) Info: Next lattice write time is 510000
2024-04-30 11:35:00) Info: Time is 25.50000000000000
2024-04-30 11:35:00) Info: Lattice write time is 25.50000000000000, in steps is
510000
2024-04-30 11:35:00) Info: Next lattice write time is 512000
2024-04-30 11:35:01) Info: Time is 25.60000000000000
2024-04-30 11:35:01) Info: Lattice write time is 25.60000000000000, in steps is
512000
2024-04-30 11:35:01) Info: Next lattice write time is 514000
2024-04-30 11:35:02) Info: Time is 25.70000000000000
2024-04-30 11:35:02) Info: Lattice write time is 25.70000000000000, in steps is
514000
2024-04-30 11:35:02) Info: Next lattice write time is 516000
2024-04-30 11:35:03) Info: Time is 25.80000000000000
2024-04-30 11:35:03) Info: Lattice write time is 25.80000000000000, in steps is
516000
2024-04-30 11:35:03) Info: Next lattice write time is 518000
2024-04-30 11:35:04) Info: Time is 25.90000000000000
2024-04-30 11:35:04) Info: Lattice write time is 25.90000000000000, in steps is
518000
2024-04-30 11:35:04) Info: Next lattice write time is 520000
2024-04-30 11:35:05) Info: Time is 26.00000000000000
2024-04-30 11:35:05) Info: Lattice write time is 26.00000000000000, in steps is
520000
2024-04-30 11:35:05) Info: Next lattice write time is 522000
2024-04-30 11:35:06) Info: Time is 26.10000000000000

2024-04-30 11:35:06) Info: Lattice write time is 26.10000000000000, in steps is 522000
2024-04-30 11:35:06) Info: Next lattice write time is 524000
2024-04-30 11:35:07) Info: Time is 26.20000000000000
2024-04-30 11:35:07) Info: Lattice write time is 26.20000000000000, in steps is 524000
2024-04-30 11:35:07) Info: Next lattice write time is 526000
2024-04-30 11:35:08) Info: Time is 26.30000000000000
2024-04-30 11:35:08) Info: Lattice write time is 26.30000000000000, in steps is 526000
2024-04-30 11:35:08) Info: Next lattice write time is 528000
2024-04-30 11:35:09) Info: Time is 26.40000000000000
2024-04-30 11:35:09) Info: Lattice write time is 26.40000000000000, in steps is 528000
2024-04-30 11:35:09) Info: Next lattice write time is 530000
2024-04-30 11:35:10) Info: Time is 26.50000000000000
2024-04-30 11:35:10) Info: Lattice write time is 26.50000000000000, in steps is 530000
2024-04-30 11:35:10) Info: Next lattice write time is 532000
2024-04-30 11:35:11) Info: Time is 26.60000000000000
2024-04-30 11:35:11) Info: Lattice write time is 26.60000000000000, in steps is 532000
2024-04-30 11:35:11) Info: Next lattice write time is 534000
2024-04-30 11:35:12) Info: Time is 26.70000000000000
2024-04-30 11:35:12) Info: Lattice write time is 26.70000000000000, in steps is 534000
2024-04-30 11:35:12) Info: Next lattice write time is 536000
2024-04-30 11:35:13) Info: Time is 26.80000000000000
2024-04-30 11:35:13) Info: Lattice write time is 26.80000000000000, in steps is 536000
2024-04-30 11:35:13) Info: Next lattice write time is 538000
2024-04-30 11:35:14) Info: Time is 26.90000000000000
2024-04-30 11:35:14) Info: Lattice write time is 26.90000000000000, in steps is 538000
2024-04-30 11:35:14) Info: Next lattice write time is 540000
2024-04-30 11:35:15) Info: Time is 27.00000000000000
2024-04-30 11:35:15) Info: Lattice write time is 27.00000000000000, in steps is 540000
2024-04-30 11:35:15) Info: Next lattice write time is 542000
2024-04-30 11:35:16) Info: Time is 27.10000000000000
2024-04-30 11:35:16) Info: Lattice write time is 27.10000000000000, in steps is 542000
2024-04-30 11:35:16) Info: Next lattice write time is 544000
2024-04-30 11:35:17) Info: Time is 27.20000000000000
2024-04-30 11:35:17) Info: Lattice write time is 27.20000000000000, in steps is 544000
2024-04-30 11:35:17) Info: Next lattice write time is 546000
2024-04-30 11:35:18) Info: Time is 27.30000000000000

2024-04-30 11:35:18) Info: Lattice write time is 27.30000000000000, in steps is 546000
2024-04-30 11:35:18) Info: Next lattice write time is 548000
2024-04-30 11:35:19) Info: Time is 27.40000000000000
2024-04-30 11:35:19) Info: Lattice write time is 27.40000000000000, in steps is 548000
2024-04-30 11:35:19) Info: Next lattice write time is 550000
2024-04-30 11:35:20) Info: Time is 27.50000000000000
2024-04-30 11:35:20) Info: Lattice write time is 27.50000000000000, in steps is 550000
2024-04-30 11:35:20) Info: Next lattice write time is 552000
2024-04-30 11:35:21) Info: Time is 27.60000000000000
2024-04-30 11:35:21) Info: Lattice write time is 27.60000000000000, in steps is 552000
2024-04-30 11:35:21) Info: Next lattice write time is 554000
2024-04-30 11:35:22) Info: Time is 27.70000000000000
2024-04-30 11:35:22) Info: Lattice write time is 27.70000000000000, in steps is 554000
2024-04-30 11:35:22) Info: Next lattice write time is 556000
2024-04-30 11:35:23) Info: Time is 27.80000000000000
2024-04-30 11:35:23) Info: Lattice write time is 27.80000000000000, in steps is 556000
2024-04-30 11:35:23) Info: Next lattice write time is 558000
2024-04-30 11:35:24) Info: Time is 27.90000000000000
2024-04-30 11:35:24) Info: Lattice write time is 27.90000000000000, in steps is 558000
2024-04-30 11:35:24) Info: Next lattice write time is 560000
2024-04-30 11:35:25) Info: Time is 28.00000000000000
2024-04-30 11:35:25) Info: Lattice write time is 28.00000000000000, in steps is 560000
2024-04-30 11:35:25) Info: Next lattice write time is 562000
2024-04-30 11:35:26) Info: Time is 28.10000000000000
2024-04-30 11:35:26) Info: Lattice write time is 28.10000000000000, in steps is 562000
2024-04-30 11:35:26) Info: Next lattice write time is 564000
2024-04-30 11:35:27) Info: Time is 28.20000000000000
2024-04-30 11:35:27) Info: Lattice write time is 28.20000000000000, in steps is 564000
2024-04-30 11:35:27) Info: Next lattice write time is 566000
2024-04-30 11:35:28) Info: Time is 28.30000000000000
2024-04-30 11:35:28) Info: Lattice write time is 28.30000000000000, in steps is 566000
2024-04-30 11:35:28) Info: Next lattice write time is 568000
2024-04-30 11:35:29) Info: Time is 28.40000000000000
2024-04-30 11:35:29) Info: Lattice write time is 28.40000000000000, in steps is 568000
2024-04-30 11:35:29) Info: Next lattice write time is 570000
2024-04-30 11:35:30) Info: Time is 28.50000000000000

2024-04-30 11:35:30) Info: Lattice write time is 28.50000000000000, in steps is 570000
2024-04-30 11:35:30) Info: Next lattice write time is 572000
2024-04-30 11:35:31) Info: Time is 28.60000000000000
2024-04-30 11:35:31) Info: Lattice write time is 28.60000000000000, in steps is 572000
2024-04-30 11:35:31) Info: Next lattice write time is 574000
2024-04-30 11:35:32) Info: Time is 28.70000000000000
2024-04-30 11:35:32) Info: Lattice write time is 28.70000000000000, in steps is 574000
2024-04-30 11:35:32) Info: Next lattice write time is 576000
2024-04-30 11:35:33) Info: Time is 28.80000000000000
2024-04-30 11:35:33) Info: Lattice write time is 28.80000000000000, in steps is 576000
2024-04-30 11:35:33) Info: Next lattice write time is 578000
2024-04-30 11:35:34) Info: Time is 28.90000000000000
2024-04-30 11:35:34) Info: Lattice write time is 28.90000000000000, in steps is 578000
2024-04-30 11:35:34) Info: Next lattice write time is 580000
2024-04-30 11:35:35) Info: Time is 29.00000000000000
2024-04-30 11:35:35) Info: Lattice write time is 29.00000000000000, in steps is 580000
2024-04-30 11:35:35) Info: Next lattice write time is 582000
2024-04-30 11:35:36) Info: Time is 29.10000000000000
2024-04-30 11:35:36) Info: Lattice write time is 29.10000000000000, in steps is 582000
2024-04-30 11:35:36) Info: Next lattice write time is 584000
2024-04-30 11:35:37) Info: Time is 29.20000000000000
2024-04-30 11:35:37) Info: Lattice write time is 29.20000000000000, in steps is 584000
2024-04-30 11:35:37) Info: Next lattice write time is 586000
2024-04-30 11:35:38) Info: Time is 29.30000000000000
2024-04-30 11:35:38) Info: Lattice write time is 29.30000000000000, in steps is 586000
2024-04-30 11:35:38) Info: Next lattice write time is 588000
2024-04-30 11:35:39) Info: Time is 29.40000000000000
2024-04-30 11:35:39) Info: Lattice write time is 29.40000000000000, in steps is 588000
2024-04-30 11:35:39) Info: Next lattice write time is 590000
2024-04-30 11:35:40) Info: Time is 29.50000000000000
2024-04-30 11:35:40) Info: Lattice write time is 29.50000000000000, in steps is 590000
2024-04-30 11:35:40) Info: Next lattice write time is 592000
2024-04-30 11:35:41) Info: Time is 29.60000000000000
2024-04-30 11:35:41) Info: Lattice write time is 29.60000000000000, in steps is 592000
2024-04-30 11:35:41) Info: Next lattice write time is 594000
2024-04-30 11:35:42) Info: Time is 29.70000000000000


```

2024-04-30 11:35:42) Info: Lattice write time is 29.700000000000000, in steps is
594000
2024-04-30 11:35:42) Info: Next lattice write time is 596000
2024-04-30 11:35:43) Info: Time is 29.800000000000000
2024-04-30 11:35:43) Info: Lattice write time is 29.800000000000000, in steps is
596000
2024-04-30 11:35:43) Info: Next lattice write time is 598000
2024-04-30 11:35:44) Info: Time is 29.900000000000000
2024-04-30 11:35:44) Info: Lattice write time is 29.900000000000000, in steps is
598000
2024-04-30 11:35:44) Info: Next lattice write time is 600000
2024-04-30 11:35:45) Info: Time is 30.000000000000000
2024-04-30 11:35:45) Info: Lattice write time is 30.000000000000000, in steps is
600000
2024-04-30 11:35:45) Info: Next lattice write time is 602000
2024-04-30 11:35:45) Info: Data output thread finished.
2024-04-30 11:35:45) Info: Simulation file closed.

```

[28]: <jLM.RDME.File at 0x7f1fd0496a90>

5 4. Analysis

The trajectory will be saved as h5 format, we need the python package `h5py` to access it, or you can download the [HDFView](#) to see it in a GUI.

```

[29]: import matplotlib.pyplot as plt
import seaborn as sns
from jLM.RDME import File as RDMEFile

```

```

[30]: # traj_file = h5py.File('T1_bimolecular.lm ', 'r')
traj = RDMEFile(filename)
ts, As = traj.getNumberTrajectory(species="A")
ts, Bs = traj.getNumberTrajectory(species="B")
ts, Cs = traj.getNumberTrajectory(species="C")

```

```

[31]: # now visuzlize the trajectories with seaborn and plt
sns.set(style="whitegrid")
# Create a color palette
palette = sns.color_palette()
plt.figure(figsize=(10,6))
plt.plot(ts, As, label='A',marker='o', linestyle='-',color=palette[0])
plt.plot(ts, Bs, label='B',marker='x', linestyle='--',color=palette[1])
plt.plot(ts, Cs, label='C',color=palette[2])

plt.title('Trajectories of Biomolecular System with polar distribution')
plt.xlabel('Time (s)')
plt.ylabel('Counts')

```

```
plt.legend()  
plt.savefig('./images/TutR1.2_bimolecular_polardis.png')  
plt.show()
```

