

# NNLSQ

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## Grid in Cartesian coordinates

Two ways to generate noise/remove bias: coordinate-wise, or for each grid point (more expensive)

Construct velocity moment matrix and solve

## Grid in spherical coordinates

Equal volume/equal radius?

# TODO

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- ☒ NTC collisions
- ☒ I/O of particle properties (basic)
- ☒ Particle generation (equal weights)
- ☒ Properties computation
  - ☒ basic ones
  - ☒ moments
- ☒ I/O of output
- ☒ Maxwellian test case (equal weights)
- ☒ Two species relaxation (equal weights)
- ☒ BKW test case (equal weights)
- ☒ Particle generation (variable weight)
- ☒ Grid merging
- ☐ Octree merging
- ☐ mixing rule VHS creator
- ☐ The science begins

## TODO: features

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- ☐ Add time to output (since we can change dt on the fly)
- ☐ Compute  $\sigma_{g\_vhs}$  directly (to avoid additional multiplication)

- ☐ Avoid duplicate computation of particle indices in grid-based merging? Avoid second loop? Use Welford's algorithm + initial estimate of mean as middle of box? Or just shift data?

## TODO: tests

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- ☐ energy / momentum conservation in scattering
- ☒ correct indexing
- ☒ BKW var weight reference solution
- ☐ 1D - no merging, particles don't switch cells during variable weight collisions!!!