Tobia Claglüna :: AMAS Group, LSM

IPPL Meeting

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Friction Coefficient: Maxwellian Test-Case

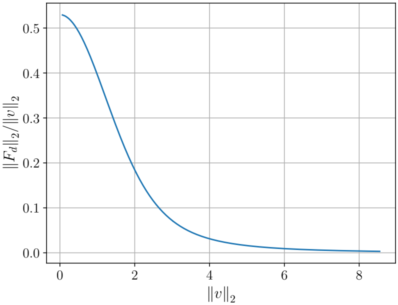

Figure 1: F_d distribution across v on a 64^3 grid.

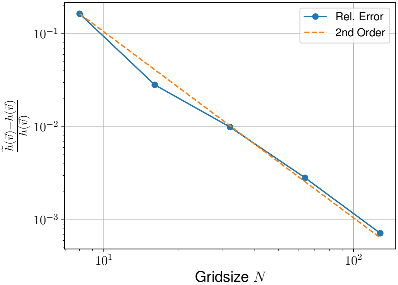

Figure 2: Relative error of $h(\vec{v})$ at increasing gridsizes.

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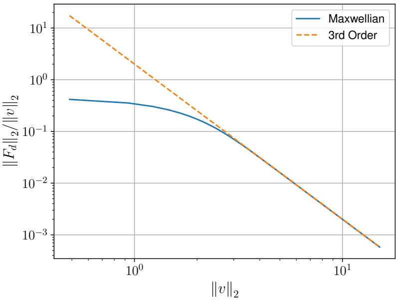

Figure 3: F_d log-log-distribution across v on a 64^3 grid. Expected $1/v^3$ fall-off.

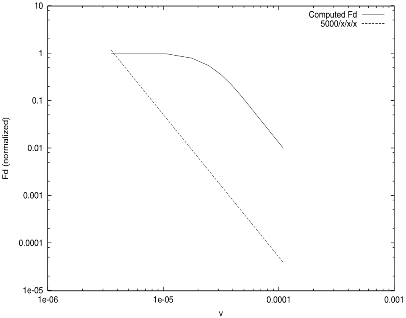

Figure 4: Asymptotic fall-off as described in Qiang et al. [2000].

Friction Coefficient: DIH

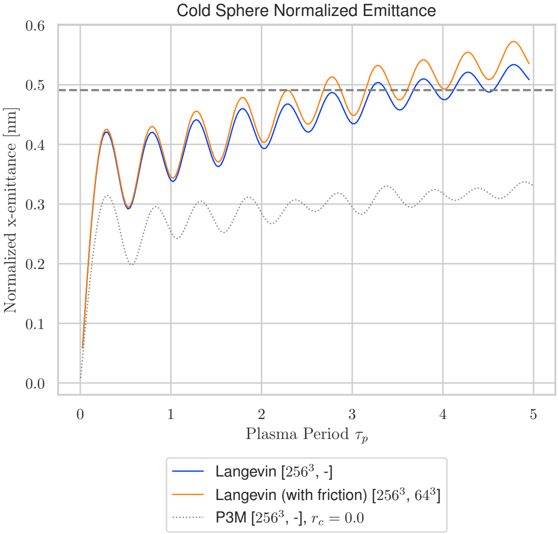

Figure 5: DIH with and without added Friction coefficient.

2nd Rosenbluth Potential: Maxwellian Test-Case

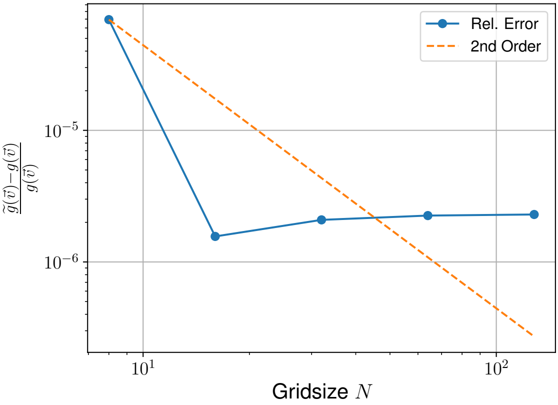

Figure 6: $g(\vec{v})$ potential at increasing gridsizes

Progress

- ☑ Setup v-space datastructures
- Tools needed for Rosenbluth Potentials:
  - ☑ Hockney Solver: $h(\vec{v})$
  - ☑ Biharmonic Solver: $g(\vec{v})$
  - ☐ Onesided Hessian: $\boldsymbol{D}(\vec{v}) = \Gamma \frac{\partial^2}{\partial \vec{v} \partial \vec{v}}$
- Maxwellian Test-Case:
  - ☑ $F_d(\vec{v})$
  - ☐ $\boldsymbol{D}(\vec{v})$
- Application to DIH:
  - ☑ $F_d(\vec{v})$
  - ☐ $\boldsymbol{D}(\vec{v})$

References I

Ji Qiang, Robert D. Ryne, and Salman Habib. Self-consistent langevin simulation of coulomb collisions in charged-particle beams. In *Proceedings of the 2000 ACM/IEEE Conference on Supercomputing*, SC '00, page 27–es, USA, 2000. IEEE Computer Society. ISBN 0780398025.