WIR SCHAFFEN WISSEN – HEUTE FÜR MORGEN

Tobia Claglüna ::   AMAS Group, LSM

IPPL Meeting

June 20, 2023

Contact: tobia.clagluena@psi.ch

Friction Coefficient too small with VICO?

Results from Sonali on a test-case having domain-size and input in same magnitude to what we see in DIH:

- VICO solver error converges
- HOCKNEY solver error does not converge

$\implies$ VICO solver might nonetheless give us the 'correct' solution and HOCKNEY's F_d is wrong.
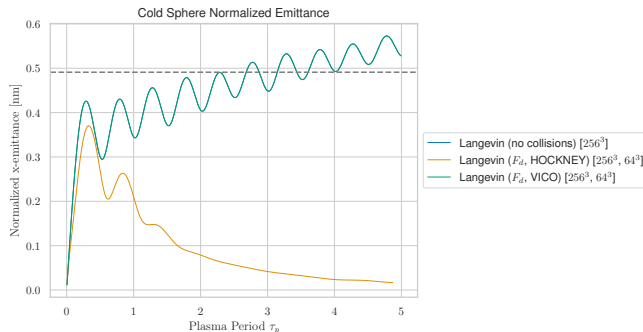

Figure 1: Normalized Emittance with / without collisions.

Domain Resizing for FFT

Run FFT Poisson solve on $[-1, 1]^3$ to compute $\nabla h(v)$ and $g(v)$:

- Rescale particle velocities to $[-1, 1]^3$ with $\overline{v} = \Theta(v) = v/2v_{max} + v_{vmax}$
- Scatter density on $[-1, 1]^3$ and run Poisson solvers
- Gather and rescale potentials with inverse functions

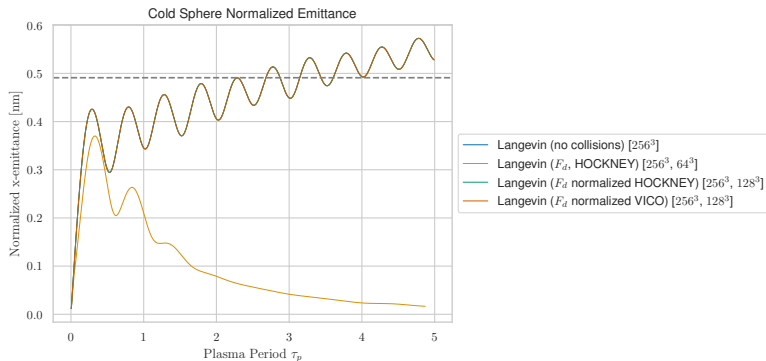# F_d is too small in HOCKNEY and VICO

Figure 2: Normalized Emittance with / without collisions. Computed on rescaled velocity-space.

$\implies$ VICO solver gives us the 'correct' solution and HOCKNEY's F_d needed normalization of v-space ✓.

TODOs

- Extend 'TestLangevinPotentials.cpp' to resemble domain normalization we do in 'Langevin.cpp'
- Continue writing