Simulation data summary

(Mar 30, 2022)

Today I receive the first batch of simulation data from Cristian. Here, I convert the simulation parameters to experimental ones, and use plots to provide an overview of the results. Simulation details, namely v_{bath}, τ and boundary conditions, I have to confirm with Cristian.

Dimensionless parameters Π_1 and Π_2

$$\Pi_1 = \frac{v_{bath}}{\tilde{v}}$$

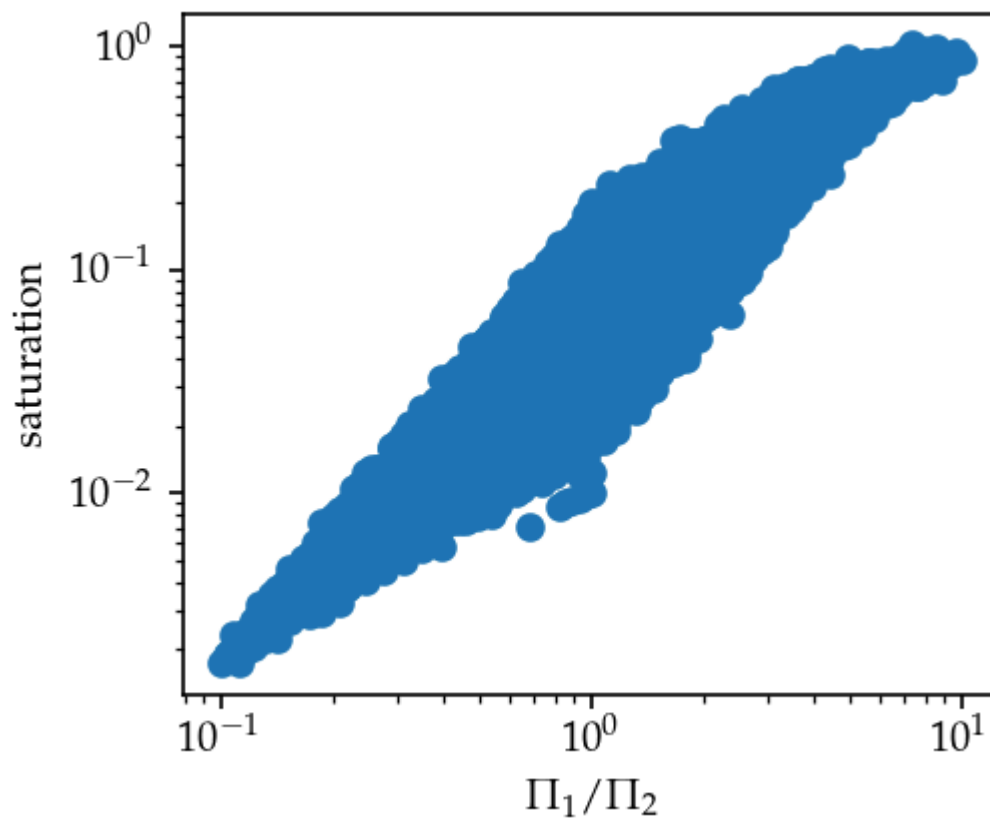$$\Pi_2 = \frac{v_{bath}\tau}{r}$$

where $\tilde{v} = \frac{2\Delta\rho g r_i^2}{9\eta}$ is the sedimentation velocity, $r = r_o - r_i$ is the free space radius of the double emulsion.

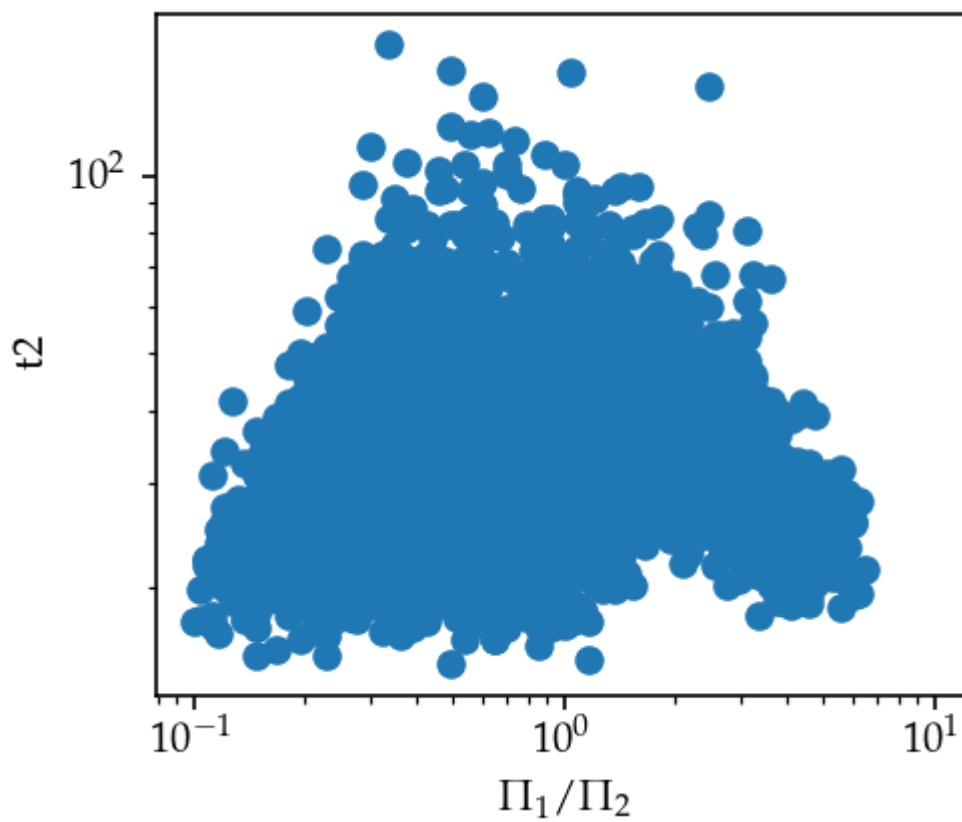$$\frac{\Pi_1}{\Pi_2} = \frac{r}{\tilde{v}\tau} = \frac{9\eta}{\Delta\rho g\tau}\frac{D-d}{d^2}$$

For constant τ, $\Pi_1/\Pi_2 \propto (D-d)/d^2$. Therefore, we can plot R_∞ and τ^* simulation data (as "saturation" and "t2" from Cristian) against Π_1/Π_2 to get similar plots as the experimental ones.

Plots

saturation vs. Π_1/Π_2

t_2 **vs.** Π_1/Π_2

Questions

1. Is τ a constant throughout all the cases? I understand that Π_1 and Π_2 are the

only variable that affects the simulation result, but using the information to deduce geometrical parameter requires the knowledge of τ.

2.