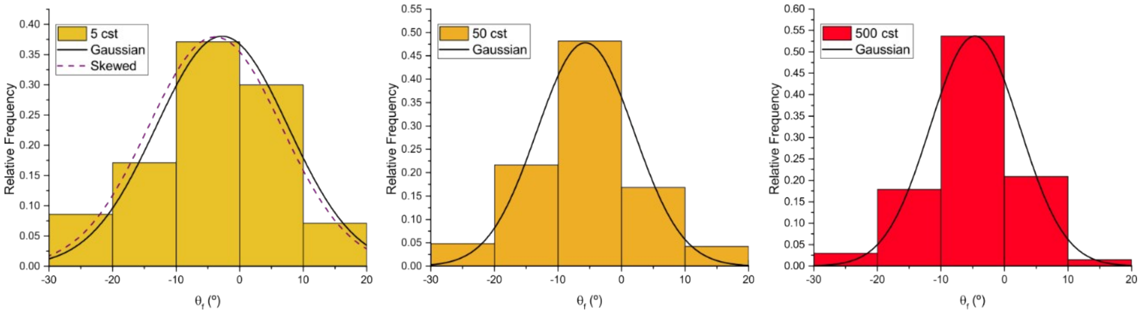
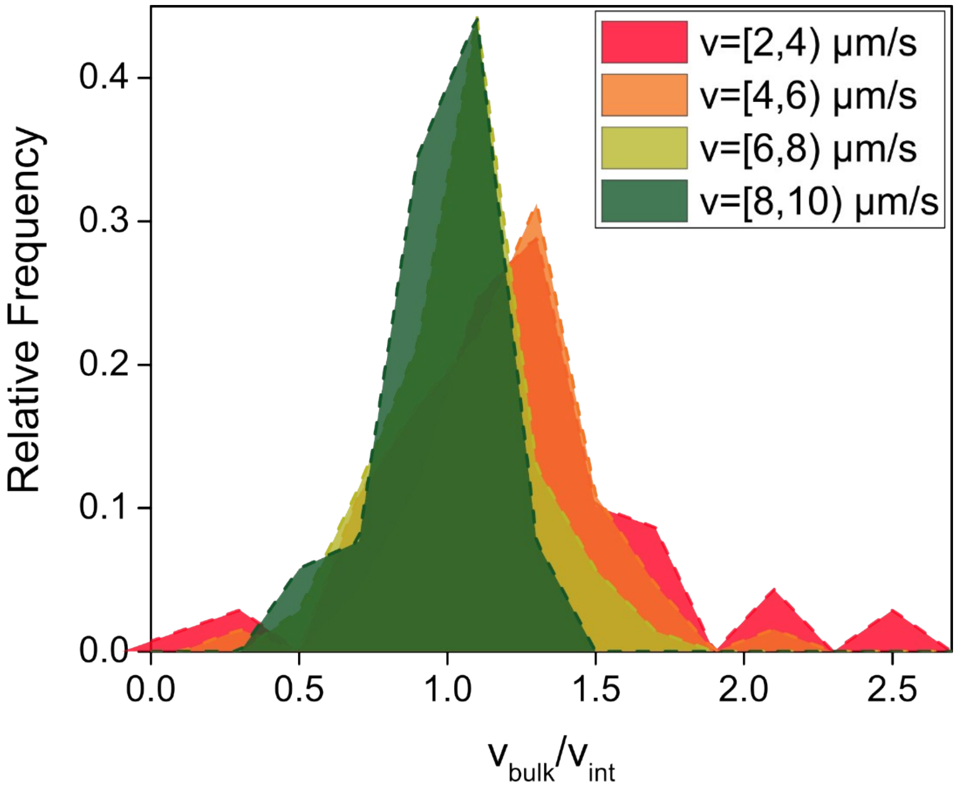
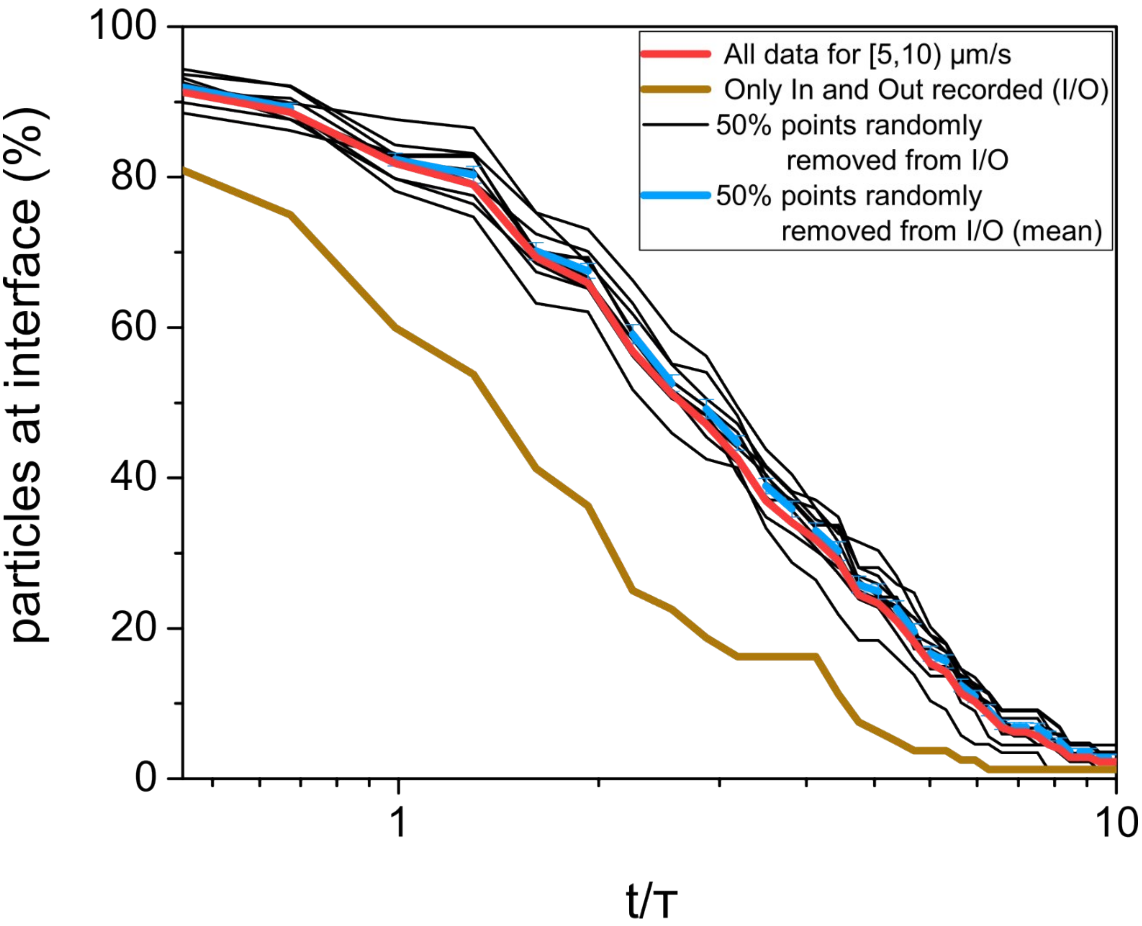
Supplementary information



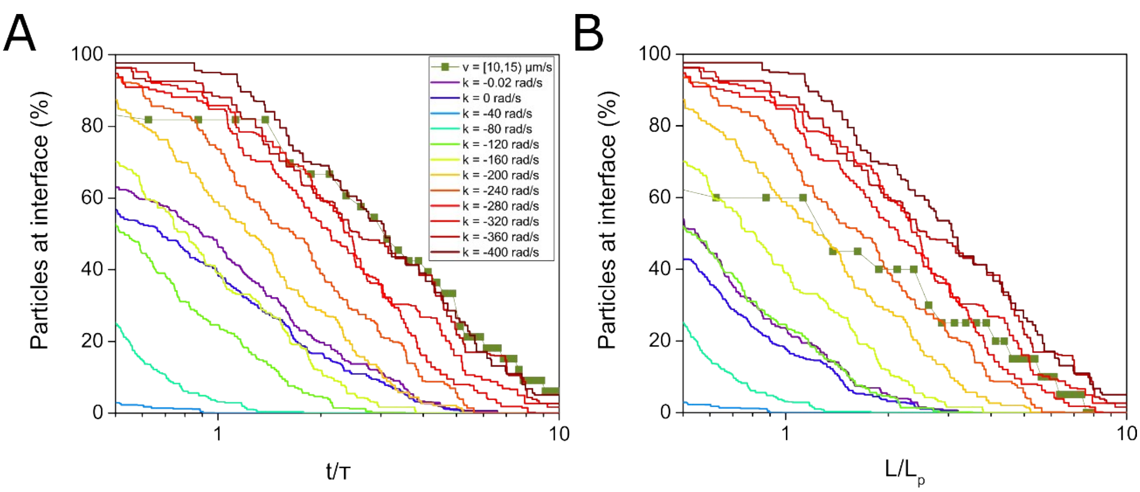
SI Fig 1. Particle orientation change after they contact the interface. Particles obtain a stable orientation angle no matter on the oil viscosity. We fit our experimental data to Gaussian distributions. All of them are compatible with a mean value of $-6 \pm 10º$ indicating no clear preference for the particle to point into or away from the oil phase. Since data for 5cst could seem left-skewed, we also fitted it to a skewed normal distribution. Value of the shape parameter is α=0.25, and therefore we do think that still is compatible with a normal distribution.



SI Fig 2. Speed distributions. We present speed distributions for each bin of Fig. 3C.



SI Fig 3. Extra data for particles at interfaces. If one tries to remove these videos from where we do not have the entrance and exit of a particle from the interface, we make a big bias.



SI Fig 4. Extra data for spring constant determination. We present how our model fits for our experimental values with different k values. We compare data only to experimental values for [10,15) µm/s. A) We found a good agreement for retention times using k = -360 rad/s. B) When we look for length values, data for k= -360 rad/s was not the best fit, but k = -240 rad/s was.

SI S1.mp4:
The video S1.mp4 (original speed) shows the self-propulsion of an active colloid (radius 2.5 micrometers) moving through water and on top of a glass surface approaching a liquid-liquid interface. After it contacts the interface, the particle realigns its orientation and follows along the interface.

SI S2.mp4:
The video S2.mp4 (original speed) shows the self-propulsion of a smaller active colloid (radius 1.0 micrometer) next to a liquid-liquid interface similar to S1.mp4. In this case, the particle shows stronger angular fluctuations while moving along the interface. This lets the particle to occasionally switch the direction of motion along the interface without releasing from it.