Supplementary Information

Structural and dynamical equilibrium properties of diffusing hard board-like particles in parallel confinement

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S1. Simulation settings

Table 1: Translational and rotational diffusion coefficient at infinite dilution of the HBPs studied in this work.

W^*	${D_T^{tra}D_0}^{-1}$	${D_W^{tra}D_0}^{-1}$	${D_L^{tra}D_0}^{-1}$	$D_T^{rot}\tau$	$D_W^{rot}\tau$	$D_L^{rot}\tau$
1	$2.2 \cdot 10^{-2}$	$2.2 \cdot 10^{-2}$	$3.1 \cdot 10^{-2}$	$1.1 \cdot 10^{-3}$	$1.1 \cdot 10^{-3}$	$2.3 \cdot 10^{-2}$
8	$9.4 \cdot 10^{-3}$	$1.4 \cdot 10^{-2}$	$1.5 \cdot 10^{-2}$	$3.5 \cdot 10^{-4}$	$3.6 \cdot 10^{-4}$	$6.3 \cdot 10^{-4}$

Table 2: Details of systems with prolate hard board-like particles and DMC simulations settings with correspondent acceptance rates.

$\{W^* = 1\,,\, L^* = 12\}$							
N	L_x/T	L_y/T	h/T	$dt_{MC,1}/\tau$	$\mathscr{A}_1$	$dt_{MC,2}/\tau$	$\mathscr{A}_2$
1200	~ 63.3	~ 63.3	25	10^{-5}	0.998	10^{-2}	0.934
1800	~ 63.3	~ 63.3	37	10^{-5}	0.998	10^{-2}	0.934
2400	~ 63.3	~ 63.3	49	10^{-5}	0.998	10^{-2}	0.934

Table 3: Details of systems with dual-shaped hard board-like particles and DMC simulations settings with correspondent acceptance rates.

$\{W^* \sim 3.46\,,\, L^* = 12\}$							
N	L_x/T	L_y/T	h/T	$dt_{MC,1}/\tau$	$\mathscr{A}_1$	$dt_{MC,2}/\tau$	$\mathscr{A}_2$
1200	~ 117.7	~ 117.7	25	10^{-5}	0.999	10^{-2}	0.970
1800	~ 117.7	~ 117.7	37	10^{-5}	0.999	10^{-2}	0.970
2400	~ 117.7	~ 117.7	49	10^{-5}	0.999	10^{-2}	0.970

Table 4: Details of systems with oblate hard board-like particles and DMC simulations settings with correspondent acceptance rates.

$\{W^* = 8\,,\, L^* = 12\}$							
N	L_x/T	L_y/T	h/T	$dt_{MC,1}/\tau$	$\mathscr{A}_1$	$dt_{MC,2}/\tau$	$\mathscr{A}_2$
1200	~ 178.9	~ 178.9	25	10^{-5}	0.999	10^{-2}	0.978
1800	~ 178.9	~ 178.9	37	10^{-5}	0.999	10^{-2}	0.979
2400	~ 178.9	~ 178.9	49	10^{-5}	0.999	10^{-2}	0.979

S2. Slabs definition

In Tables 5, 6, 7 are reported all the sizes of each slab we used for the calculation of all the dynamical properties of the suspensions in confinement.

Table 5: Definition of the slabs used for the computation of the dynamical properties of the HBPs in parallel confinement, for systems with $h = 25T$.

slab label	Δx	Δy	Δz
$l_{\omega,bot}, 25T$	$[0, L_x]$	$[0, L_y]$	$[0, 3.5T]$
$l_{1,bot}, 25T$	$[0, L_x]$	$[0, L_y]$	$[3.5T, 6.5T]$
$l_{2,bot}, 25T$	$[0, L_x]$	$[0, L_y]$	$[6.5, 9.5T]$
$l_{3,bot}, 25T$	$[0, L_x]$	$[0, L_y]$	$[9.5T, 12.5T]$
$l_{3,top}, 25T$	$[0, L_x]$	$[0, L_y]$	$[12.5T, 15.5T]$
$l_{2,top}, 25T$	$[0, L_x]$	$[0, L_y]$	$[15.5T, 18.5T]$
$l_{1,top}, 25T$	$[0, L_x]$	$[0, L_y]$	$[18.5T, 21.5T]$
$l_{\omega,top}, 25T$	$[0, L_x]$	$[0, L_y]$	$[21.5T, 25T]$

Table 6: Definition of the slabs used for the computation of the dynamical properties of the HBPs in parallel confinement, for systems with $h = 37T$.

slab label	Δx	Δy	Δz
$l_{\omega,bot}, 37T$	$[0, L_x]$	$[0, L_y]$	$[0, 3.5T]$
$l_{1,bot}, 37T$	$[0, L_x]$	$[0, L_y]$	$[3.5T, 6.5T]$
$l_{2,bot}, 37T$	$[0, L_x]$	$[0, L_y]$	$[6.5, 9.5T]$
$l3, bot, 37T$	$[0, L_x]$	$[0, L_y]$	$[9.5T, 12.5T]$
$l_b, 37T$	$[0, L_x]$	$[0, L_y]$	$[12.5T, 24.5T]$
$l_{3,top}, 37T$	$[0, L_x]$	$[0, L_y]$	$[24.5T, 27.5T]$
$l_{2,top}, 37T$	$[0, L_x]$	$[0, L_y]$	$[27.5T, 30.5T]$
$l_{1,top}, 37T$	$[0, L_x]$	$[0, L_y]$	$[30.5T, 33.5T]$
$l_{\omega,top}, 37T$	$[0, L_x]$	$[0, L_y]$	$[33.5T, 37T]$

Table 7: Definition of the slabs used for the computation of the dynamical properties of the HBPs in parallel confinement, for systems with $h = 49T$.

slab label	Δx	Δy	Δz
$l_{\omega,bot}, 49T$	$[0, L_x]$	$[0, L_y]$	$[0, 3.5T]$
$l_{1,bot}, 49T$	$[0, L_x]$	$[0, L_y]$	$[3.5T, 6.5T]$
$l_{2,bot}, 49T$	$[0, L_x]$	$[0, L_y]$	$[6.5, 9.5T]$
$l_{3,bot}, 49T$	$[0, L_x]$	$[0, L_y]$	$[9.5T, 12.5T]$
$l_b, 49T$	$[0, L_x]$	$[0, L_y]$	$[12.5T, 36.5T]$
$l_{3,top}, 49T$	$[0, L_x]$	$[0, L_y]$	$[36.5T, 39.5T]$
$l_{2,top}, 49T$	$[0, L_x]$	$[0, L_y]$	$[39.5T, 42.5T]$
$l_{1,top}, 49T$	$[0, L_x]$	$[0, L_y]$	$[42.5T, 45.5T]$
$l_{\omega,top}, 49T$	$[0, L_x]$	$[0, L_y]$	$[45.5T, 49T]$

In the manuscript, we estimated some properties of the systems from HBPs found in slabs, defined here in Tables 5-7. Due to the symmetric nature of the systems investigated, we averaged out the properties obtained from HBPs found in opposite slabs ("*top*" and "*bottom*"), with respect to the walls. More specifically, we refer to either the slab at the bottom wall $l_{\omega,bot}$ or the slab at the top wall $l_{\omega,top}$ slabs as l_ω in the manuscript; the properties obtained from HBPs found in l_ω slabs have been averaged together and are labelled with ω in the manuscript. Similar procedure has been applied for the calculation of the properties with label l_1, which are obtained as average of properties obtained from $l_{1,bot}$ and $l_{1,top}$ slabs; l_2 as average between $l_{2,bot}$ and $l_{2,bot}$ slabs; and l_3 as the average between $l_{3,bot}$ and $l_{3,top}$. The only exceptions are the results obtained in the slabs

corresponding to the bulk region, l_b, which have been found only in systems with $h = 37T$ and $49T$. These slabs are, by definition, much bigger than all the other slabs defined (see Tables 6 and 7), and they have been used as reference for the discussion of the particle dynamics in the proximity of the walls.