Supplementary Information

Coupling and Decoupling between Translational and Rotational Dynamics in Supercooled Monodisperse Soft Janus Particles

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Figure S1: The schematically illustration of vertical and horizontal components of the total angular displacement. In MSAD, the total angular displacement $\theta_i(t)$ is given by $\theta_i(t) = \int_0^t \omega_i(t) \, dt$, where $\omega_i(t)$ is the angular velocity of particle $i$ at time $t$. In RMSAD, the total reorientational angular displacement $\phi_i(t)$ is defined as $\phi_i(t) = \int_0^t \{\omega_i(t) - [\omega_i(t) \cdot n_i(0)]n_i(0)\} \, dt$, where $\omega_i(t)$ is the angular velocity of particle $i$ at time $t$. Since the quantity $\omega_i(t) - [\omega_i(t) \cdot n_i(0)]n_i(0)$ is the vertical component of $\omega_i(t)$ along $n_i(0)$, $\phi_i(t)$ can be regarded as the vertical projection of total angular displacement along particle orientation at initial time. It is the vertical component of total angular displacement that makes a contribution to the particle reorientation.
Figure S2: The temperature dependence of translational $\alpha_2^T(t)$ and rotational $\alpha_2^R(t)$ non-Gaussian parameters.