



P.15 Detachment energies of spheroidal particles from liquid-liquid interfaces

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The energy required to detach a single particle from a liquid-liquid interface is an important parameter for designing certain soft materials: e.g. emulsions stabilised by colloidal particles [1, 2], colloidosomes designed for targeted drug delivery [3], and bio-sensors composed of magnetic particles at liquid-liquid interfaces. Calculating the detachment energy of spheroids necessitates the difficult measurement of particle-fluid surface tensions [4] -in contrast to spheres, where the contact-angle suffices. We develop a simplified detachment energy model for spheroids involving only the particle aspect-ratio and the height of the particle centre-of-mass above the liquid-liquid interface. By simulating the detachment of a single particle from a liquid-liquid interface using a multicomponent lattice-Boltzmann model, we validate the model and provide further quantitative evidence for the use of lattice-Boltzmann methods in the simulation of particle-stabilised emulsions[5].

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