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**Modelling transport of magnetic particles across a liquid-liquid interface** SOURAV MONDAL, IAN GRIFFITHS, University of Oxford, SCOTT TSAI, NIKI ABBASI, Ryerson University — Microfluidic technologies have facilitated the self-assembly of a variety of particle clusters with enhanced control. Magnetic particles have the unique advantage of allowing precise control of their motion through a non-invasive mechanism (by tuning the external magnetic force-field). Recent work has utilized the interface formed between immiscible liquid phases to enable such self-assembly. Here we consider a microfluidic set-up consisting of two fluids with different surface tensions and viscosities. Magnetic particles are introduced into one of the fluids and the external magnetic field pulls the particles through the interface into the second fluid. We analyses the features of the magnetic particle transport through the liquid–liquid interface for two different interface regimes: non-deformable, no-slip interfaces, and deformable, slip interfaces. The results of the model allow for tuning of the magnetic field and interfacial tension to facilitate a route for the formation of aggregates of a desired size.

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