

Abstract Submitted
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Using artificial microswimmers for particle separation

VYACHESLAV R. MISKO, University of Antwerp, Belgium, WEN YANG, Taiyuan University of Science and Technology, P.R. China, KWINTEN NELISSEN, University of Antwerp, Belgium, MINGHUI KONG, Institute of Plasma Physics, Hefei, P.R. China, FRANCOIS M. PEETERS, University of Antwerp, Belgium — Microscopic self-propelled swimmers capable of autonomous navigation through complex environments provide appealing opportunities for localization, pick-up and delivery of micro-and nanoscopic objects. Inspired by motile cells and bacteria, man-made microswimmers have been created, and their motion was studied experimentally in patterned surroundings [1]. We propose to use artificial microswimmers – Janus spheres [2] illuminated by light – as “driving agents” that move through a binary mixture of colloidal particles. We demonstrated [3] that binary mixtures can be effectively separated in this way. We analyzed the main features of the particle separation and explained mechanisms of different regimes including the one with a velocity inversion. Our finding can be readily verified in experiments with colloidal binary mixtures and could be of use for various biological and medical applications.

[1] G. Volpe et al., *Soft Matter* **7**, 8810 (2011).

[2] Q. Chen et al., *Science* **331**, 199 (2011).

[3] W. Yang, V.R. Misko, K. Nelissen, M. Kong, and F.M. Peeters, arXiv:1109.5099 (2011).

Vyacheslav R. Misko
University of Antwerp, Belgium

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