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Using artificial microswimmers for controlling the motion of passive colloidal particles in straight and asymmetric channels VYACHESLAV R. MISKO, University of Antwerp — Artificial self-propelled microswimmers capable of autonomous navigation through complex environments provide appealing opportunities for localization, pick-up and delivery of micro-and nanoscopic objects. Such self-driven microswimmers show not only the ability to navigate through the environment but also modify the environment. Using numerical simulations, we investigate active Brownian motion of self-propelled overdamped microswimmers, i.e., Janus spheres illuminated by light, in straight and corrugated channels. We demonstrated that a small fraction of active microswimmers injected in a system of passive colloids are capable of rectifying the passive species (i.e., in asymmetric channels [1]) or separating various species (i.e., in a mixture of passive species [2]). We analyze the effect of autonomous pumping of passive species by active microswimmers in various corrugated channels.

[1] Pulak K. Ghosh, Vyacheslav R. Misko, Fabio Marchesoni, and Franco Nori, Phys. Rev. Lett. **110**, 268301 (2013).
[2] W. Yang, V.R. Misko, K. Nelissen, M. Kong, and F.M. Peeters, Soft Matter **8**, 5175 (2012).

Vyacheslav Misko
Univ of Antwerp

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