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**Self-propelled Janus particles in an asymmetric channel: Effects of rectification and autonomous pumping** VYACHESLAV R. MISKO, Univ of Antwerp, PULAK K. GHOSH, CEMS, RIKEN, Saitama, Japan, FABIO MARCHESONI, University of Camerino, Italy, FRANCO NORI, CEMS, RIKEN, Saitama, Japan — Using numerical simulations, Brownian transport of self-propelled overdamped microswimmers (i.e., Janus particles) in a two-dimensional periodically compartmentalized asymmetric channel has been investigated for different compartment geometries, boundary collisional dynamics, and particle rotational diffusion [1]. The resulting time-correlated active Brownian motion is subject to rectification in the presence of spatial asymmetry. We demonstrate that ratcheting of Janus particles is much stronger than for ordinary thermal potential ratchets and thus experimentally accessible. In particular, we show that autonomous pumping of a large mixture of passive particles can be induced by just adding a small fraction of self-propelled Janus particles.

[1] Pulak K. Ghosh, Vyacheslav R. Misko, Fabio Marchesoni, and Franco Nori, *Phys. Rev. Lett.* **110**, 268301 (2013).

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