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**Hydrodynamically enforced entropic trapping of Brownian particles** STEFFEN MARTENS, Technische University, Berlin, Germany, GERHARD SCHMID, University Augsburg, Augsburg, Germany, ARTHUR STRAUBE, LUTZ SCHIMANSKY-GEIER, Humboldt-University of Berlin, Berlin, Germany, PETER HÄNGGI, University Augsburg, Augsburg, Germany — In small systems on length scales spatial confinement causes entropic forces that in turn implies spectacular consequences for the control for mass and charge transport. In view of its importance, recent efforts in theory triggered activities which allow for an approximate description that involves a reduction of dimensionality; thus making detailed predictions tractable. Up to present days, the focus was on the role of conservative forces and its interplay with confinement. Within the presented work, we overcome this limitation and succeeded in considering also non-conservative forces that derive from a vector potential [S. Martens et al., PRL 110, 010601 (2013)]. A relevant application is the fluid flow across microfluidic structures where a solute of Brownian particles is subject to both, an external bias and a pressure-driven flow. Then a new phenomenon emerges; namely, the intriguing finding of identically vanishing average particle flow which is accompanied by a colossal suppression of diffusion. This entropy-induced phenomenon, which we termed hydrodynamically enforced entropic trapping, offers the unique opportunity to separate particles of the same size in a tunable manner [S. Martens et al., Eur. Phys. ST 222, 2453-2463 (2013)].

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