Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Collisions and rebounds of active droplets[1] KEVIN LIPPERA, MATVEY MOROZOV, MICHAEL BENZAQUEN, SEBASTIEN MICHELIN, LadHyX, UMR CNRS 7646, Ecole polytechnique, 91128 Palaiseau, France — Active droplets undergoing gradual micellar dissolution and spontaneous self-propulsion have recently received much interest as prototypical experimental realisations of synthetic micro-swimmers. While the self-propulsion of a single droplet has been widely studied and is known to arise above a critical advection-to-diffusion ratio, interactions and motion in complex environments remain mostly unexplored due to the non-linearity of the transport equation and its coupling with the flow that prevent the use classical superposition methods.
Using a novel numerical framework relying on bi-spherical coordinate we solve the nonlinearly coupled hydrodynamics and solute dynamics exactly, enabling to characterise the rebound for various advection-to-diffusion ratios and to unravel the dominant interactions.

[1]This project has received funding from the European Research Council (ERC) under the European Unions Horizon 2020 research and innovation programme under Grant Agreement 714027 (SM).

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Date submitted: 29 Jul 2019 Electronic form version 1.4