

Abstract Submitted
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Extracting work from gradients in active motion NITZAN RAZIN, Weizmann Institute of Science, RAPHAEL VOITURIEZ, Laboratoire Jean Perrin and Laboratoire de Physique Theorique de la Matiere Condensee, CNRS/Universite Pierre et Marie Curie, JENS ELGETI, Theoretical Soft Matter and Biophysics, Institute of Complex Systems and Institute for Advanced Simulation, Forschungszentrum Juelich, NIR GOV, Department of Chemical Physics, Weizmann Institute of Science — We study how the active motion of particles can cause a pressure gradient on a large inert object that moves it to a target position. This is motivated by recent experiments, which showed that the nucleus of a mouse oocyte (immature egg cell) moves from the cortex to the center due to a pressure gradient exerted by the active motion of vesicles. We calculate the force on a symmetric inert object inside a system of active particles with position dependent motion parameters, in one and two dimensions. We characterize a system where such a force exists, both in terms of the model parameters and in terms of measurable quantities: the density, velocity and pressure profiles.

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