Dynamic optical rectification and delivery of active particles: Supplementary Information Movie Captions

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In the Supplementary Information we show movies from experiments and simulations, originating from the data shown in figures 2 and 3 of the main text. The single experimental movie contains contrast-adjusted microscopy images with the extracted $\tilde{\rho}$. The simulation movies, offer a clearer depiction of the motion of the particles/bacteria, by using the exact parameters from the main text, which are as close to experimental parameters as possible. On simulations with a static pattern the total time was set to 150s, while for $\gamma > 0$ the total running time was kept at $ut/\Lambda = 5$.

"**'SI_Movie_1_Experimental.avi'**": Experimental movie of static and dynamic (Low, mid and high) patterns as shown in figs. 2a, 2b, 3a and 3b. Of interest is the phenomenology of how dynamic patterns are able to persistently concentrate or empty their centre squares, while the static pattern returns towards its initial density ($\tilde{\rho} = 0$).

"**'SI_Movie_2_Sim_Static_Brownian.avi'**": Simulation movie of the static pattern with Brownian motion (fig. 2c). Of interest is the gradual change of the speed distribution of active particles in the illuminated region, favoring slower particles towards the end.

"**'SI_Movie_3_Sim_Static_NonBrownian.avi'**": Simulation movie of the static pattern without Brownian motion (fig. 2c). The lack of brownian motion traps the particles in the non-illuminated regions.

"**'SI_Movie_4_Sim_Mid_Brownian.avi'**": Simulation movie of the dynamic pattern (Mid) with Brownian motion (figs. 2c, 3b and 3d). The movie illustrates the mechanisms of accumulation for $\gamma \approx 1$.

"**'SI_Movie_5_Sim_Low_Brownian.avi'**": Simulation movie of the dynamic pattern (Low) with Brownian motion (figs. 3b and 3d). The movie illustrates the depletion mechanisms for $\gamma < 1$.

"**'SI_Movie_6_Sim_High_Brownian.avi'**": Simulation movie of the dynamic pattern (High) with Brownian motion (figs. 3b and 3d). The movie illustrates the loss of accumulation efficiency for $\gamma > 1$.

"**'SI_Movie_7_Sim_Low_NonBrownian.avi'**": Simulation movie of the dynamic pattern (Low) without Brownian motion (fig. 3d). The movie more clearly illustrates the depletion mechanisms for $\gamma < 1$, without the complications of thermal motion.