

Magnetically driven omnidirectional artificial microswimmers

Supplementary Information

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Movie 1: The first type of magnetically actuated artificial swimmers, the throwers. The cycle frequency is 2 Hz and to exclude drifting effects, we always observed swimmers moving in opposite directions. The diameter of the large sphere is 4.5 microns.

Movie 2: A close-up on the motion of a thrower at 0.3 Hz. The diameter of the large sphere is 4.5 microns.

Movie 3: A close-up on the motion of a thrower at 8 Hz. The diameter of the large sphere is 4.5 microns.

Movie 4: The second type of magnetically actuated swimmer, the rower. The rower is wedged between two glass plates, making the swimming more efficient. The cycle frequency is 1 Hz and the diameters of the spheres are 2.7 microns.

Movie 5: Omnidirectional magnetic swimmer. The same magnetic field sequence is used to drive the rower around a circular track. The sphere diameter is 2.7 microns.