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**Self-assembled magnetocapillary swimmers** MAXIME HUBERT, GEOFFROY LUMAY, FLORIANE WEYER, NORIKO OBARA, NICOLAS VANDEWALLE, GRASP, University of Liege, B4000 Liege, Belgium — Capillary driven self-assembly consists of suspending small objects at a water-air interface. Due to the effects of wetting, gravity and surface tension, the interface is slightly deformed, inducing a net force between the particles. In the experiments we present, we consider the presence of a vertical magnetic field acting on soft-ferromagnetic particles. Dipole-dipole repulsion competes with capillary attraction such that 2d ordered structures are self-assembling. By adding a secondary horizontal and oscillating magnetic field, periodic deformations of the assembly are induced. Pulsating particle arrangements start to swim, either translating or rotating. The physical mechanisms and geometrical ingredients behind this cooperative locomotion are identified. Furthermore, strategies to control the swimming dynamics are proposed.

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