

# Spin lattices of walking droplets

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Millimetric liquid droplets can walk while bouncing on the surface of a vibrating liquid bath [1, 2]. We present experiments that demonstrate the spontaneous emergence of collective behavior in spin lattices of these walking droplets [3]. Circular wells at the bottom of the fluid bath encourage individual droplets to walk in clockwise or counter-clockwise direction along circular trajectories centered at the lattice sites. A thin fluid layer between the wells enables wave-mediated interactions between neighboring walkers resulting in coherent rotation dynamics across the lattice. When the pair-coupling is sufficiently strong, interactions between neighboring droplets may induce local spin flips leading to anti-ferromagnetic order.

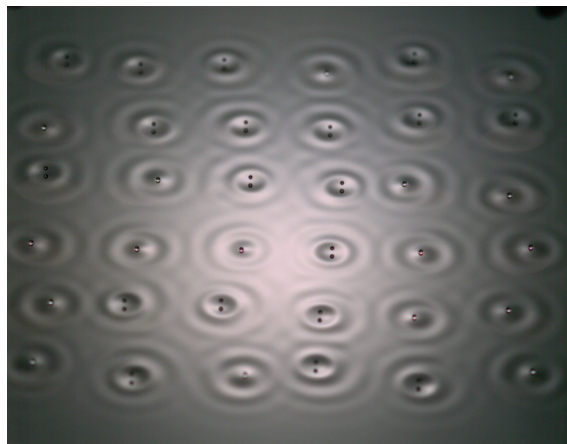


Figure 1: A 2D spin lattice of walking droplets.

This work was supported by the US National Science Foundation through grants CMMI-1333242, DMS-1614043 and CMMI-1727565. G. P. thanks the program CNRS Momentum for its support.

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- [3] P. J. Sáenz, G. Pucci, A. Goujon, T. Cristea-Platon, J. Dunkel, J. W. M. Bush. Spin lattices of walking droplets, to appear in *Phys. Rev. Fluids* (2018).