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Author: Mr. Christoph Klopp  
Otto von Guericke University of Magdeburg, Germany, christoph.klopp@ovgu.de

HYDRODYNAMICS OF DROPLET LATTICES IN QUASI 2D FREE-STANDING LIQUID CRYSTAL  
FILMS**Abstract**

In the OASIS experiment on the ISS [1], we studied colloids in two dimensions, by means of the preparation of microdroplets on thin freely suspended liquid-crystalline films. These droplets have a repulsive interaction, they form nearly regular triangular lattices on the films. The layered structure in the smectic A phase allows the preparation of thin and very homogeneous macroscopic films. We record the motion of the droplets and calculate their diffusion characteristics. The experiments are compared to numerical simulations of droplet assemblies, assuming specific repulsive interaction potentials. The mean-square displacement of the droplet positions in the lattice reveals mobilities in the 2D fluid and information on the interaction potential. The experiment represents a unique quasi-2D colloidal crystal.

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[1] N. A. Clark et al., Realization of hydrodynamic experiments on quasi-2D liquid crystal films in microgravity, ASR Volume 60, 737-751, 2017