

Microparticle dynamics near a regular nanopillar array.

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The trajectories of particles suspended in a fluid, whilst flowing through and above a regular array of nanopillars, are computed for a variety of initial conditions and shear flow angles. The simulations are carried out using lattice-Boltzmann methods in the ESPResSo soft matter simulation software. The ability of the system to discretely separate and sort particles of different sizes from an initial mixture is investigated, especially with the aim of seeing if the effect can be reproduced when particles lie above the nanopillar forest completely. The role of thermal fluctuations and body forces on the particles trajectories are also looked into, as well as the effect of modifying the shape of the structured rigid nanopillars.