Simulation of blade printing of colloidal morphologies

ALEXANDER WAGNER, ALAN DENTON, ERIK HOBBIE, Department of Physics, North Dakota State University — We present a new four-component multi-phase lattice Boltzmann simulation method and its application to blade printing of colloidal morphologies. We consider a solution of colloids and polymers that is applied as a thin film on a substrate. As the mixture is exposed to the surrounding air the solvent evaporates leaving the colloid-polymer mixture unstable to phase-separation. Our new method predicts that as a function of the application speed, initial concentrations, and film thickness different morphologies can be generated.