Kinetics of the Isotropic-Smectic phase transition

Z. Dogic

Rowland Institute at Harvard, Harvard University, Cambridge, MA 02142, USA

Email: dogic@rowland.harvard.edu

We study the kinetics of the isotropic-smectic phase transition in a colloidal rod/polymer mixture. First, we show that the bulk isotropic-smectic phase transition is preceded by a surface freezing transition in which a quasi two-dimensional smectic phase wets the isotropic-nematic interface. Next, we identify a two step pathway for the formation of bulk smectic phase. In the first step a metastable isotropic-nematic interface is formed. This interface is wetted by the surface iduced smectic phase. In the subsequent step, smectic layers nucleate at this surface phase and grow into the isotropic bulk phase.