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Amphiphilic Systems under shear flow HONGXIA GUO, Beijing National Laboratory for Molecular Sciences (BNLMS), Institute of Chemistry, Chinese Academy of Sciences, Beijing — Phase behavior and the related physical and rheological properties of the amphiphilic systems including liquid crystals, diblock copolymers and surfactants are of wide-spread interest, e.g. in industrial processing of layered materials or biological applications of lipid membranes. For example, submitted to an applied shear flow, these lamellae show an interesting coupling of the layer orientation and the flow field. Despite an extensive literature dealing with the shear-induced transition, the underlying causes and mechanisms of the transition remain largely speculative. The experimental similarities between systems of different molecular constituents indicate, that the theoretical description of these reorientations can be constructed, from a common generic basis. Hence one can develop an efficient computer model which is able to reproduce the properties pertinent to real amphiphilic systems, and allows for a large-scale simulation. Here, I employed a simplified continuum amphiphilic computer model to investigate the shear–induced disorder-order, order-order and alignment flipping by large-scale parallelized (none) equilibrium molecular dynamics simulation

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