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stability of nematic state in periodically modulated nematic phases

Nematic liquid crystals composed of bent-core molecules may exhibit periodically modulated structure. One of these phases is the twist bend nematic phase where the molecules are arranged in a heliconical structure with a nanoscale pitch. This can be characterized when the bend elastic constant is much smaller than both splay and twist elastic ones. We study the model of the twist bend nematic phase that allows the bend elastic constant to be small but in the positive range and attain its minimizer in one dimensional setting. We also characterize the parameter regime for the stability of the global and local minimizers of the nematic phase under the homeotropic boundary condition. Numerical simulations based on the constrained minimization is used to illustrate the predictions of the analysis. This is a joint work with C. Garcia-Cervera, T. Giorgi, and Z. Li.