

We consider a one-dimensional variational problem arising in connection with a model for cholesteric liquid crystals. The principal feature of our study is the assumption that the twist deformation of the nematic director incurs much higher energy penalty than other modes of deformation. The appropriate ratio of the elastic constants then gives a small parameter ϵ entering an Allen-Cahn-type energy functional augmented by a twist term. We consider the behavior of the energy as ϵ tends to zero. We demonstrate existence of local energy minimizers classified by their overall twist, find the Gamma-limit of these energies and show that it consists of twist and jump terms. This is joint work with Dmitry Golovaty (Akron) and Michael Novack (UT Austin).