1077-35-938 **Lei Z. Cheng*** (zhang86@math.purdue.edu), 150 N. University Street, West Lafayette, IN 47907.
Static and Dynamic Features of Liquid Crystal Films.

We analyze a model based on the energies introduced by de Gennes and Chen-Lubensky to find the chevron structure arising from the cooling from the Sm-A liquid crystal to the nonchiral Sm-C phase in a surface-stabilized cell with planar boundary conditions. We show that the chevron is the thermodynamic equilibrium structure by analytically minimizing the energy using the methods in calculus of variation and the notion of $\Gamma-$convergence. There are two distinct stable director states with the same free energy. This feature of bistability is widely used in optical applications, where the cell is switched between the stable states, i.e., between a dark and a bright state, which happens when an external electric field is added. We analyze how the molecules switch from one stable state to the other under an electric field by considering an initial value problem for the gradient flow for this non-linear second order energy. This work is joint with D. Phillips. (Received September 22, 2011)