1099-35-180 **Sookyung Joo*** (sjoo@odu.edu), Department of Mathematics and Statistics, Old Dominion University, Norfolk, VA 23529, and **Carlos J Garcia-Cervera**. *Field response of smectic A liquid crystals.*

We study the Landau-de Gennes free energy to describe the undulatory instability in smectic A liquid crystals subjected to magnetic fields. We prove this phenomena by the bifurcation theory to the nonlinear system of Landau-de Gennes model for smectic liquid crystals. We find the critical field and oscillatory description of the undulations which are consistent with experimental results. When the applied field is sufficiently large, the smectic states are maintained, with the director parallel to the field. We perform numerical simulations to illustrate the results of our analysis and demonstrate the tilted layers and directors near the boundary at the equilibrium state. The three dimensional study for smectic liquid crystals under the magnetic field will be also discussed. (Received February 07, 2014)