

Exercises related to the chapter on liquid crystals.

Solutions due April 12th.

1. Exercises (5.1) and (5.4) from Doi “Soft Matter Physics” book.

2. Magnetic Fréedericksz transition

Demonstrate that the experimental setups schematically drawn in Fig. 1(a), and (b) may be used to estimate the splay, K_1 , and the bend K_2 elastic constants, respectively. Use the parametrization of the director in terms of the tilt angle θ , and assume $\theta \ll 1$, i.e., magnetic field $H \simeq H_c$, where H_c is the threshold amplitude of the magnetic field (see LC notes).

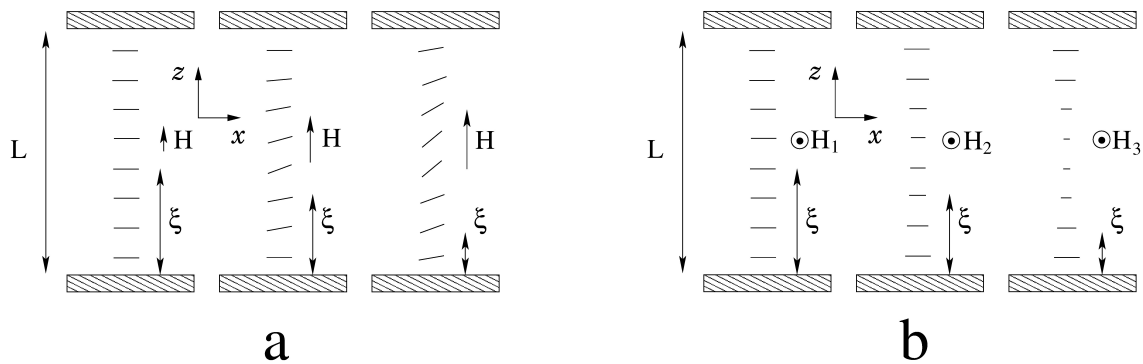


Figure 1: Schematic presentation of the setups for measuring K_1 in (a), and K_2 in (b) by using the magnetic Fréedericksz transition.