

# Molecular Crystals and Liquid Crystals

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## Orientational Dynamics in Nematic Liquid Crystal under Decay Poiseuille Flow

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### Abstract

We report the results on the orientational dynamics and instabilities in nematic liquid crystal MBBA induced by decaying Poiseuille flow. The experiments were carried out in the rectangular wedge-shape LC cell with thickness varying perpendicular to the flow direction and the confining plates provided homeotropic alignment of a nematic liquid crystal. Increasing the values of initial pressure difference the orientational instability corresponding to the escape of the director out of the shear plane was observed for the first time. This “out-of-plane” transition takes place at some critical pressure difference  $\Delta P_c$  which depends on the local thickness of NLC layer. The results of numerical simulations of governing nematodynamic equations are in a good agreement with experimental data on the threshold of “out-of-plane” instability.