

Spatio-temporal Analysis of Electroconvection in Nematics

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We investigate electroconvection in nematic liquid crystals by means of optical microscopy. Time resolved optical images are used to study the director dynamics. For the first time we present instant images in the dielectric regime. A numerical simulation of the optical transmission patterns is performed on the basis of Fermat's principle. In the instant images of dielectric rolls, the periodicity of the observed optical pattern is equal to the wavelength λ of the convection rolls. The well known low contrast 'stationary' optical texture observed in conventional experiments results from time averaging of these instant images; its wavelength is $\lambda/2$.

Key words: Liquid Crystals; Pattern Formation; Electrohydrodynamic Instability;
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