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Real space analysis by direct observation in liquid crystal dynamics BEOM-JIN YOON, MIN SANG PARK, JUNG OK PARK, MOHAN SRINIVASARAO, Georgia Institute of Technology — We describe a facile route for studying dynamics of nematic liquid crystals. We analyzed real space images of the system that can't be resolved by optical microscopes, for which the typical investigations have been done in reciprocal space. We have imaged the director fluctuations, which are slow and large enough to be detected by an optical microscope. A series of the digital images of a homogeneously aligned nematic liquid crystals were obtained under the cross-polarized microscope with a non-coherent light, white light source, and a high speed camera. We made Fourier analysis of the time and spatial series of the images, and this procedure provided a wide range of the wave vector dependent information, which is equivalent to multi-angle light scattering of the nematic liquid crystals. The characteristic times of the correlation function were measured. Dynamic properties of the liquid crystals and temperature dependence of them were evaluated through combination of real space intensity information, Fourier optics, and well known theories developed in scattering method.

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